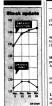
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY PUTERWOR

\$2/CORY- \$44/YEAR

MOL XX NO 13



Product Spotlight lini/mainframe DBMS: One systematic

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Girich Parikh on cleaning up Cobol/59

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TOP OF THE NEWS

ute financial review pulls the plug on the 3Com merger with Con vergent Technologies. Page 110.

nen at federal agencies suffers from problems sim to those found in the private sector, but change is under way Page 29.

A micro data base package coming in May from Alpha Software Corp. is ex pected to give users a new option to Ashton-Tate's Dbase III, Page 33.

Burroughs rolls out an entry-level model of its V series mainframes and a new operating system Page 10. . OAC quiatty expires in Houston. Page

14. Meanwhile, in Las Vegas, Pick sys-tem devotees ponder legal and standards issues Page 12.

If you listen to the analysts, IBM is go-ing to be busy April 2. That's the day — April Fools' Day has apparently disrupted the company's normal Tuesday announcement procedure — IBM is exince a 20M-byte harddisk option for the Personal Computer XT, price cuts on the PC XT of 17% to 26% and cuts on the PC AT as high as 22%. But why stop there? Other possibilities are a new version of Topview that can access all PC-DOS functions, a 2M-byte random-access memory extend for PCs, a new PC AT running at 8 MHz with plug-in RAM allowing 640K bytes on the motherboard and the everpossible lanton

Apple Computer is entering final newith 3Com about plans to gotiations with 3Com about plans to produce a Macintosh file server, sources said. The product, which is not expected to be released until July, will be man-ufactured by 3Com and sold to Apple for distribution.

Quotron Systams, Inc. Chairman and Chief Executive Officer Milton E. Mohr said last week that has board felt Citi-See NEWS name A

Answer/DB micro link

By Charles Babcock NEW YORK — IBM has brought under its product umbrella an outside firm's mi-

cro-to-mainframe link that provides enduser access to IBM's leading mainframe data bases. The product, Answer/DB for Personal Computer Products, will be available from IBM beginning April 18

Answer/DB offers IMS, VSAM and DL/1 data to users of microcomputer applica tions from Ashton-Tate and Lotus Development Corp. Answer/DB was developed by Informatics General Corp., now the Anware, Inc. of Canoga Park, Calif

ware, Inc. of Canoga Park, Calif.

Answer/DB will also access Cullinet
Software, Inc.'s IDMS and Software AG of See IBM page 2

Data match hits welfare fraud

By Mitch Betts WASHINGTON, D.C. — This fall the In-

ternal Revenue Service will launch a con puter matching program in cooperation with state and local officials in an effort to identify welfare cheats Experts describe the effort, undertaken at congressional directive, as the broadest use of IRS data for nontax purposes ever ordered by the U.S.

The Income and Eligibility Verification System, mandated by the Deficit Reduc tion Act of 1984, is aimed at identifying applicants and recipients of federal aid programs who earn interest or dividend in come that would make them legally includ-See DATA page 6

IBM markets | Net options drive show

Managers at Interface find non-AT&T choices

By Elisabeth Horwitt
ATLANTA — As vendors justled each other to announce the latest connectivity device, system and/or scheme, last week's Interface '86 communications trade show turned into a battleground for more than 300 exhibitors and into a postdivestiture shoppers' paradise fur telecommunications managers

Typical was the comment of Douglas Barteau, communications manager for Guarantee Financial Corporation of Cali forma in Fresno: "I'm old enough to re-member a time when Ma Bell was the only game in town when it came to networking equipment You had limited technology controlled by one vendor. Now there are 49 suppliers of T1 multiplexers in the U.S.

T1 market opens up

ATLANTA - Seeking to exploit a treod among large users to justify T1 network a surprising number of communivendors at Interface '86 last week an-nounced T1 products that link up with most types of digital private branch ex changes as well as with AT&T Communi cations services

viewed at Interface confirmed vendors perceptions of a burgeoning demand for ef fective voice/data integration over TI

We're looking for someone with a mod ulation technique to transmit data nver ware on T1 lines and still maintain circuit integrity," said David Kornreich, second See T1 name &

CW EXCLUSIVE

Stellar performance: Real-time analysis has Halley's by the tail carried by the Flyby satellite Giotto. All

Eddy Goldberg he National Aeronauties and Space Administration budget cut-backs that greatly reduced U.S. participation in the Halley's Comet Flyby earlier this month were only another

challenge to scientists at the Southwest Research Institute in San Antonio. The scientists responded by devising a real-time data collection and analysis system that was the only Flyby experi-

ent to produce graphics within seconds of receipt of the data by the aponsoring European Space Agency

The real-time system was a compo-nent of the Johnstone Plasma Analyzer. one of 10 separate on-board experim

of the experiments were designed to help determine the chemical composition of Halley's comet; the JPA experiment was designed to focus on the composition of particles in the comet's tail and he they mix to produce the tail

In their initial prop to NASA, Southwest Research Institute scientists had not

planned on creating a real-time system for the JPA. However, said David Winningham, who headed the institute team the switch to real-time was made because of the once-in-a-lifetime nature of

the celestial event and his team's desito broadcast data from Giotto to scien tists and the public as soon as possible. Giotto's real-time system was built

around a dual-processor Masscomp 5500 32-bit su permicro running under a Unix virtual memory operating system. Each processor included a Motor

Inc. 68010-based CPU, with 2M bytes of memory and a floating-point accelerator. Winningham's team cor structed the system in just six months drawing upon hardware and software

configurations they had used in previous

See DEAL THAT care 4

MEWSPAPER

IBM puts PCs and terminals under same discount structure

By Douglas Barney IBM has changed its volume pur chase program to allow IBM Personal Computers and terminals to be pur chased under one discount structure. Because big customers use PCs as

rkstations anyway, we put them both in une volume procurement agreement," said IBM spokesman Pant Neuman, Under the plan, IBM Personal Computers, mainframe in teractive displays and ASCII displays are all part of the same category When you buy a large vulnme

PCs in conjunction with a large vol ome of the display stations, the price you are paying for the PCs is proba bly a little lower than the discount would indicate became you are nayaggregate price. said. IBM also increased the discount from 24% to 27% on purchases of from 250 to 499 Personal Computers

The mure things you can lump together the higher discounts you can noted Robert Antall, vice-pri nt of MIS fur Child World. Inc. in

Avun. Mass. Larger users, however, see less im We have a special bid, which gives us substantially more discounts than the published schedule," said Arun Maheshwari, vice-president of

the systems division for New York Customers who currently have

volume purchase agree quest a transition to the new agree ment by notifying IBM in writing be-30, 1986. customers with current IBM microcomputer vulume purchase agree ments who desire a new contract must commit to at least the same quantity of machines as called for in the previous contract

IBM markets Answer/DB link

North America, Inc's Adabas, "which is an example of IBM turning the tables on the independent soft-ware companies," said Ted Jast-zembeki, senior consoltant with the software research program at Intenational Data Corp. (IDC). During the been successfully selling then data base management systems into

DIM installations Jastrzembski also speculated IBM will link Answer DB to its DB2 data This would be an interesting way for them to pot an umbrella over both the JMS and DB2 environhe said A Sterling executive would not rule out such a move but said that the action has not been disd with IBM at this point

IBM is marketing a link from an in-IBM's links have done a particularly good job of getting people to use them," said market analyst Frank Gens, an IBM watcher also working for Framingham, Mass, based IDC IBM is not going to endorse an

other vendor's product unless it absaid Steven Pfren solutely has to sident of IMS Consulting in North Ruize Calif He added that IBM may endorse additional produc packages from other ve IBM wants to protect its DRMS products, and any independent ven dor that provides a tool to interface

with those products is something that IBM is interested in," he added. Pfrenginger said the agreement is a shot in the arm" for Sterling at a me when the line that once sold un

der the information name is agree Answer DB is one of the few bright pots in the [Sterling] product line

Beginning April 18, IBM will uffer Answer DB for \$20,000 to DOS oper ating system users and \$35,000 to OS system users. Answer/DB versions in as an application under CICS or IMS/VS and require one of two micro packages Lotus Answer or Dbase

Answer IBM will market the m frame software under its own label and the micro software, which sells

for \$550 per package, under the Sterling label According to one experienced Answer/DB user, Carl F. Rahmovi manager of support systems for Transamerica Corp in Los Angeles

the product is "a time-saving piece of software" and IBM's decision to market the Answer line "brings a kind of approval to my decision making Transamerica has used Answer, DB and related micro packages for mately 18 months, Rahmq-

would take a computer-generated renort and rekey the information into 2-3. It was very time consuming and error prone," Rahmqvist said. With the link, requests for data made through the micro package and accourage the mainframe via IBM 3270 terminal emulation, where it is xecuted by Answer/DB, according

to IBM. The data is placed in a com munications file and, opon user re quest sent to a microcomputer where it can be entered into Dhase II. III or Dbase/Answer, or into 1-2-3 and Symphony, using Lotus/Ariswer,

cess to mainframe data can be limited at the level of data base, re cord, segment, field or field value, ac cording to IBM. The built-in security cessing department to maintain co trol of mainframe resources," IBM spokesmen said.

Sterling officials said the firm is developing Answer/DB links to other miero packages, but they would not st on specific prod icts Sterling will continue to sell the

products, with pricing "in the same range" as IBM's, according to Sterling Vice-President Richard Sterling will provide support to all iswer customers, regardless which company makes the sale, and

the company will increase its support in anticipate sales as a result of IBM's endorse

rst Coast correspondent Maura McEnancy contributed to this report

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Pick Systems' legal battles over copy note infragement and the lack of stan dards among manufacturers of Pick is were topics debated at the recent international Data Base nt Association, Inc.'s conference/ 12 feenage hackers allegedly broke into

Inc.'s mainframe system with passwords and access codes obtained from an underground buildin board/ 13 The 7-year-old Office Automation Conference will not be held again in its present form/ 14

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COMPLITED INDUSTRY

John R. Onel will him over the IBM nanship to President and CEO John F. Akers on June 1, giving the top

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PRODUCT SPOTLIGHT



ame DBMS: A systematic approach to data base ma systems selection by Shaku Atre. Plus. choosing and managing a fourth-gener and comprehensive product charts/ 35

IN DEDTH

Restructuring engines clear away Cobol clutter: Four engines on the market to-day offer practical maintenance tools for DP. By Grish Pankh/ 59

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DEDARTMENTS



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Borland offers Real-time system discount plan to big buyers

SCOTTS VALLEY, Calif. — Bor-

land International last week intr duced a volume purchase plan, the Corporate Standardization Program, which provides discounts up to 55%. 'It is essentially a volume ourchase plan done in response to cuser requests over the past year said Robin Tygh Shephard, a Borland

Borland originally introduced a site license program in September that provided duplication rights to Borland products, but the program attracted too few customers reusing as we know it wasn't meeting the weeks of corporate customers Shephard said. Borland's site licen ram, however, has not been can celed.

Unlike many site license pro-grams. Borland's Corporate Standardization Program is not site based Instead, companywide pur chases of Borland products accumu ate and make the company eligible for larger discounts. For example, if a many accumulates porchases of worth of any Borland products that company is eligible for a 35% discount. Once a firm has accumulat ed purchases of \$75,000, it is eligible 55% discounts. Customers with purchases of more than \$75,000 qual ify for Borland's site license pro-gram Borland is also making disgram sortand is also making dis-counts available on product upgrades, but Snephard declined to give details of the supgrade plan. In uther news, Borland will an-

unce Word Wizard, a \$49.95 set of four word games, in San Francisco llus week More important than the rumes however is the commented source code available with them.

The commented source code will and wiftware developers in writing hooks into Borland's Turbo Lightning acquisition frant end to large data hases on microcomputers and compact disks, "It gives an inside peck into how Turbo Ludanie works," Sheman product, which will be positioned as to give further details of the product.

analyzes Halley's

NASA projects.

One processor was dedicated to receiving, reformatting and writing data to disk to assure that data was collected accurately. Winningham "The data was transmitted only," he said. "We had to catch it. said Using two processors allowed us to

make sure data coming in was not interrupted or swapped out by any of the processors, You can't tell a te to hold on for a mon The second processor took the file from the disk and performed inten

sive high-speed computations to pro-duce mass spectrograms and a threedimensional matrix indicating the oumber of particles coming off the comet in a particular energy range their angle and their mass ra graphic printout was four seco

All the data collected by the JPA and other instruments aboard Giotto was gat hered in the satellite's cen tral processor and relayed to earth in real-time at 40K hyte/sec. via radio transmitter, where it was received by tracking stations in Australia, the Azores and the U.S. and retransmit ted tu mission control headquarters in Darmstadt, West Germany, via

dedicated lines The JPA was developed at the Mullard Space Science Laboratory of University College in London by research team headed by Alan John stone. The instrument consists of two sensors — one a fast ion sensor, the other an implanted ion sensor During the four-hour flyby, half

the instrumentation was lost. Winningham said, because of gas and dust particles hitting the satellite despite its protective shield. At 70 kilometers a second. a speck of dust is like a howitzer

shell," Winningham said. However, Winningham said fewer problems or curred than anticipated, and much of the equipment survived undamaged The ESA is looking at ways to bring otto back to earth in the next three to four years, he added to study the composition of the cometary parti cles that were embedded, vaporszed or melted onto it

Winningham said Johnstone cor tacted him because the community of scientists doing work in plasma Second data prolong seed of information there are deliber on making littles, and continuous control 2000 of 2041 in plantered wars extent among the street from 3 of course, Merch of Merch o

physics is relatively small. "Thos measuring the ionic component are smaller still," Winnigham explained

A group of scientists at the Max k Institute in West Germany selected the Los Alamos team for the project. This team and two groups of l'K scientists were involved in the JPA experiment. ngham said his team was

occupied about being able to pull off all that the teams from the Sweden, West Germany and Italy wanted. During the last two weeks fore shipping the real-time system to Darmstadt, last-minute programs were added to perform further ex-

pentation Three levels of goals were set. The first level was a mir goals that consisted of mostly an I/O type of operation to capture the data and present it on a high-resolution graphics monitor. Second- and third-level goals consisted of more refined computational operations or "real scientific analysis doing fairly intensive floating-point calculations Winningham said. He said many of were achieved.

Winningham cited a number of reasons for choosing the Masscomp Inix system. The team had used comp equipment previously on NASA projects and had developed data reduction and presentation software. "We wanted it to be portable and microprocessor based, so tl each mission would only require er. I prefer Unix because it frees m eing tied to any one hardware

manufacturer. I can choose hard-

ware based on the available funds." Much of the software was written on AT&T 7300s and transferred to the Masscomp machine. The software developed and tested in San Antoniu was shipped to Darmstadt in December. It arrived on a Friday. came out of customs Monday and Winningham's team had it up and ing by Wednesday. They went back two weeks before the mission

for final preparations. TOP OF THE NEWS

NEWS from paire 1 arp's takeover offer of \$19 per

share was "not adequate." sponse potentially set the stage for an attempted hostile takeover of the andine financial data service by the nation's largest commercial ink. Mohr said Quotron would consider "developing relation-ships with others with a view to consider maximizing shareholders' value, leaving the door open for a ight" partner to repel Citicorp's efforts

iBM could announce a 4381-on-a-chip machine in about a year, an-alyst Ulric Weil of the Gartner oup told a conference recently But even such a product will not give IBM enough total sales in 1987 to reach its average annua growth goals of 15%, he predicted.

Asked whether AT&T Mail might nterconnect with other private electronic mail providers such as DEC and Wang Laboratories, AT&T President James Olson last week said that AT&T Mail is "not intended to be a gateway to other

COMPLITE IWORLD

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SyncSort DOS One smart cookie deserves another.

Lotus introduces add-in tools | System problems plague N.J.

Conference promotes corporate user services

By Eric Bender CAMBRIDGE, Mass. — New assembly language add-in tools for its microcomputer spreadsheet pack and promises of greater attention to curporate customers highlighted Lotus Development Corp first developers conference held last

week Latus will offer "a second release of add-in tools for Symphony which and features, and for the first time we are going to add some equivalent tools for 1-2-3," Lotus Chairman

Mitchell Kapor said.

Available by the fourth quarter, the tools will cost \$150 and offer enhanced event management, memory management and system information ures, according to Lotus officials Corporate overs were predominant among the 460 attendees, but there

so a strong contingent of third party developers that tailor products -3 or Lotus Symphony While Lotus has been promising to address directly local-area network ssues in a series of statements dating back to 1984. Kapor said work on the

issues "should bear fruit in the nearime frame R. Gregory Lazar, director of field support, said that Lotus' 1986 plans ade more customized training at

field sites, a more formalized MIS advisory group and "new and varied ort offernes Lazar remarked that port 250 different users

He estimated that the compa-'s field support staff spends fourfifths of its time working with

with a graphical user interface, "the mainstream of development for the present and into the future emphaizes 1-2-3 as a character-based prod-Kapor said.

Among definite development plans for its star product, Lotus is working "intelligent interfaces" like the human Access Language program ac-quired with GNP Development Corp. In addition to handling English com-mands, HAL has built-in knowledge

about 1-2-3, Kapor said. Kapor also listed several research efforts. These efforts include work to boost the speed of recalculation by using new design concepts, to provide higher levels of programming structure, to integrate expert sys-tems technology and to exploit deci-

sion support systems techniques While Lotus has a large number of orks in progress, many new products will require a much more power ful system environment, with Intel Corp. 80386-based hardware and adced versions of Microsoft Corp.'s

MS-DOS, Kapor emphasized. Effect to be felt in 1967 and bey

The effect of all this great new stuff is not going to be felt in 1986 but in 1987 and beyond," he said. Among other product development efforts, the Engineering and Scientif ic Products Division will introduce at least two products this year, targeted

toward the IBM Personal Computer according to Lotus officials Within the Information Systems Division, the Information Center is revising the recently acired llink micro-to-mainframe data access software and will release an updated version in the second half of 986, said group manager Alexander

Also within that division, a new electronic mail group plans to bring a product to market by year's end, ac-While Lotus is frequently asked cording to Don McLagan, Information about plans for a 1-2-3 derivative Systems Division vice-president

Human Services' computer

By Charles Babcock TRENTON, N.J. — Data entry and

reconciliation problems are plaguing New Jersey's Department of Human Services as it attempts to implement a new financial management system, state officials said

According to James J. Dolan, the state legislature's chief auditor, the onth-old system was developed internally with belo from a consul tant, the accounting firm of Peat Marwick, Mitchell & Co. Dolan said the consultant in particular was ex pected to handle the interface be-tween the state Treasury Department, with its IBM mainframes, and man Services Department sys tem, dubbed Alstars.

Aistars, which was designed to run on a Honeywell, Inc. processor, was designed to track the flow of state and federal money into the vet erans, social services and other Hu man Services programs where a mix of national and local money is used The state's treasury system could not do this. The intent was to furnish detail not available under the Trea-sury Department's system," Dolan

neillation pro

In early 1985, however, error ere repeatedly discovered in the data being entered into the Alstars system. Dolan declined to pinpoint he source of the errors, but he said they were related to the system's opon. Related data was being entered into the Treasury Department's system but at different times, and the state was confronted with reconciliation problem," I Dolan re-

In a report to the legislature Bud-eet and Finance Officer, Dolan staterror listings and reconciliation prob

lems, the [Human Services] Department directed all its divisions to disntinue data entry on August 30."
On individual features of the sys

m, Dolan reported the following:

Obligation accounting: "This sys tem is not fully operational because it requires direct data entry, which has been suspended since last August."

• Spending plan. The "system is operational. However, it is used only "system is

on a limited basis because this fea ture requires each division to identi the spending plan level and ount of funds to be assigned to each level." Since some uf the infe tion is not available, use of the feature is optional, Dolan wrote.

• Budget plan. "It is not in operation and will require additional pro

gramming changes before it can be nut into operation • Cost accounting. "It is in opera tion However some problems exist and the information is currently being used to generate federal re-

ports as it was supposed to. Nonappropriation funds. stem is reported to be available However, no data has been entered and presently no time frame has been set for instituting operation of the

Dolan said the system was envisioned as being fully operational nine months after implementation, a schedule he termed "optimistic." Peat Marwick "did everything re-quired of them," Dolan said. Many of

the problems were the result of the parts of the system that were devel oped internally Peat Marwick will receive \$1.5 million for its share of the \$5 2 million system.

The state Appropriations Commit-tee will review how New Jersey is spending its money on computers during the budget process this year,

the englesman said

Data match in welfare fraud

From page 1

hle for such aid. Verification will be made through the IRS master file on uncarped income, thus representing the first time the data base has been tapped for this purpose according to government ufficials and a recent an nouncement by three federal entitlement agencies covered

by the system The data match could save as much as \$70 million a year from the \$39 billion Medicard program alone, the agencies claimed, but privacy advo-cates and tax officials express concern at the Big Brother implications of the

While we have to be con curned about fraud and waste in government pro grams. I have concerns that the privacy of citizens may he shortchanged as we re lease more tax information to state agencies," Sen. William S. Cohen (R-Mnine) said in a

The IRS has reservations about the program because it fears news of the computer matching program will dis-

courage taxpayers from re-porting all of their income. We have some philosop scal concerns about it," IRS spokesman Steven Pyrek said last week. "It's the law, we're doing it tried to make it clear that we have nothing to do with the program uther than sum

ply matching the computer he said. Under the verification

program, state officials will ke a tape of the names and Social Security numbers of welfare applicants and mail it to the IRS

The IRS will conduct a onthly match of each state's tape against its master file on interest and dividend income and send the tapes back showing "raw hits" of income exceeding the limits for the welfare pro-

The computer matching stem covers Medicaid, Aid o Fumilies with Dependent Children and food stamps programs. It also requires state unemployment offices to use wage records to help identify people who collect

unemployment benefits while employed. The Reagan administration, with congressional support, has vigorously pursued computer matching programs - in which one government data base is cross-checked with another - in an effort to curb fraud and abuse in financial aid

programs But the American Civil Liberties Union (ACLU) and other privacy advocates are concerned that the program erodes the principle of confi dentiality for personal tax

> Robert Ellis Smith, pub-lisher of the "Privacy Journal" newsletter, said that atted a crime. A paper by Jerry J. B computer matching is an un-constitutional "fishing expean, director of the ACLU's in which many innoprivacy and technology proj cent people are investigated ect, observed that while it is



without specific evidence that any particular individ-

uorealistic to fight all cor puter matching programs. might be wise to protect certain data bases tax information and political beliefs - from computer

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NEWS

Managers find network options

Barteau was one of an estimated 15 000 ortendees browsing through a

smorgasbord of new products. Many interface attendees found that the familiar, traditional offerings did not always constitute the

I thought I had already made a valid decision on a network applicasaid Guarantee Financial's Bartean "But at this show I learned for the first time that I can go with a second sandor and conservatively save my tompany \$125,000 over th original arrangement plus long-term cost savings from not having to back-

track from that direction Much of the Interface action or curred among the dozen T1 vendors that amroduced products in the areas of network management, compatibil ity with digital private branch exchanges and AT&T voice servi and switches that can bandle a great er number of T1 lines (see story be

Such offerings address the gray ing host of businesses that want to T1 market opens

un at Interface '86

vice-prisident and manager of net-

onment, so we can't afford a determ

Let's face it, 80% of most compa-

communications bill is voice

of Avantt Communications

rated mode during peak traffic peri

observed George Kuston, vice-presi

Corp , one of the T1 vendors making

product introduction at Interfac-

of a T1 link for data, and the other balf they want to use for an AT&T

They're telling us they only use half

The T1 products introduced at In-

rface promise to offer users more

flevibility in confiduring their own

and ensure more end-effective access to AT&T offerings

framing-specifications used by Digi

vices that manage, monitor and route

your and data transmissions over

all the yack about data traffic

justify a TI network, it uses vites

Stamford Conn research company

the Gartnel Group. Inc. "What people

want is the ability to split up band

Access and Cross

The T1 products conform to 14

Our customers complain

From nage 1

cut at least a few of AT&T's apron strings and take control in a major portion of its network facilities. AT&T, long accustomed to a cap-tive audience for its services and

products, responded to the growing ndependence of its customers by promising multivender connectivity and greater control of its servithrough Integrated Services Digital

Network (ISDN) offerings to come "ISON Services - here and now." James Oison's Interface keynote ad

itted to ISDN

"For our part, let me say that AT&T is fully committed to ISDN,"

implementing by early 1987 the ISDN Primary Rate interface that ulti nately will allow business customers to choose from the full range of

AT&T long-distance services on a call by eath basis But a number of users and ind analysts claimed that AT&T's

current service offerings do not give customers the same flexibility ntrol of networking facilities that can be provided by an in-house net

consulting company as well as in London and Bern. Niebor, Mich., consulting company, DMW Group, Inc., said, "AT&T fa-vors Digital Access and Cross Conbank said that the network would be nect, a network service that per-furms routing at the 64K bit/sec. DS0 But he added that "it would have got ten there a lot sooner" if Merrill Lynch had not gone with CCR level but which retains functionality at AT&T central offices. The problem with Digital Access and Cross Con reallocate T1 channels to balance traffic loads during the day. As it

nect is that it makes it hard to parti tion channels below the 64K level. turned out, the service is so cumbersome that we only use it to redirect Finds fault with CCF traffic when we have an actual out Doll also found fault with another

AT&T software-defined network ser vice, Customer Controlled Reconfi guration (CCR), which enables th user to specify huw T1 links are sub-divided into DS0 channels at AT&T central office facilities and then ro ed to various destinations. "CCR does not give the customer the real-time ontrol and reallucation of channels as he could get with in-house equipment," Doll said.

At an interface seminar held on Wednesday, Robert Niebank, Merrill Lynch, Pierce Fenner and Smith, Inc of telecommunications called his company's decision to become the first commercial CCR user a

Gartner's Gonzaies

about data traffic

increasing, when a

company needs to justify a T1 network,

it uses voice."

face show, there were clear signs that the telecommunications indusostly mistake Merrill Lynch used CCR in cor junction with its Mernet II, a network of multiple T1 lines linking the com-pany's sites in six major U.S. cities its Mernet II, a network try is finally becoming an open market and that business buyers are h ginning to take advantage of the fact.

pay, and

AT&T."

products

nounced

SAMS will be shapped in August

Avante

Accupac-1.5, is a T1 format processor

high-speed data terminals and Ac

cupet 1.5. The product is available now and is priced at \$3,995 for a sin

a DACS-compatible networking sys

point T1 systems to a hub that han

Infotron Systems Corp. an seed the Infostream 2500 T1 bub

Pricing was unavailable

gle-port unit

Avanti Com

Corp. introduced

System (SAMs)

dles communications sites," said 1 nmercial customer communications among all said infotron prisduct line AT&T's CCR, the service was found

to be unable to keep up with the rap nager Joseph Bulsak The 2500 is priced at \$55,000 to dly changing traffic patterns of the brokerage giant's multisite T1 net \$70,000 per node for a fully redur dant system and will be available in ATAT refuses to offer a customer

compatible T1 switch that cross-co nects 64K bit/sec. D80 channels on up to 128 1.54M bit/sec. T1 links. Timeplex spokesman William Flanagan id. DAX will be available in the sers from establishing their uwn fourth quarter of 1986.

telephone systems. "With CCR you Timeplex also announced Link/2 Visice/Data Network Exchange, a DACS-compatible network management system that has all the capab he not ties of the vendor's nider Link/I The following product plus connections to digitized are among the voice systems, Flanagan said. Avail able in October, Link/2 models start at \$15,000.

Minilink, inother new product from Timeplex, is an entry-level, pre-configured network management stem starting at \$9,000. · International Data Sciences. Inc

Special Access Management patible product, the Magnemux TI multiplexer. According to cumpany The next layer spokesman Ron Wiggins, Magne of AT&T compatibility" un the vendor's T1 multiplexer. Ultramux SAMS permits Ultramux T1 networks can reroute DS0 channels among four or five T1 links. Available by mid to ltnk up with D4-compatible digital mmer, the Magnumux is priced at ranch exchanges (PBX) and \$1 400 per channel. with the full range of AT&T service IDS also announced Maestro inte

rated network control system, IBM Personal Computer AT software that provides network monitoring, remo announcement. onfiguration and real-time alarm surveillance. The product will ship in May: pricing was not available.

• Network Equipment Technol that provides a direct link between

gies Co. chose the week before Interface to unveil Integrated Digital Network Exchange (IDNX) Series 40. a lower end version of its IDNX tran without redundant 1DNY /40

standard reasonable in tem canable of supporting up to 12 TI interfaces. "With the 2500 you can upgrade from our 1500 point tothird-quarter 1986

Olson said During the show, the corr nany announced its commitment to

work management system Davon Doll, chairman of Ann Ar

tomers' gateway to AT&T service Two such services, M24 and M-14 take customers' 1.54M bit/sec. T missions and subdivide into 24 nr 44 DS6 channels, each car rying 64K bit sec. Another AT&T service. Accuset 1.5, carries custo

of 186 channels going out of an

AT&T central office would allow us to use DACS

AT&T services of then own telephone companies, usini

switching sys-tems that car handle as many as 128 T1 links would allow to

Pobert Niebank director of tele enmunications for Merrill Lynch Purce, Fenner and Smith, Inc. scribed his company's use of a wide

rash of HACS-compatible sion technologies at a well-attended Interface seminar. "We use the telproducts is resulting from height ened vendor awareness that "despite leased lines, T1, public dial-up creasing, when a company needs to Niebank said and Jonoum Gonzales, an analyst at

links to carry crucial transactions among branch offices across the country and to customer sites Excess ice. Niebank said. When data tral Go overloads extremt T1 conscity "we just throw some of the vnice traffic onto dial-up," he added

Although Merrill Lynch was the

er transmissions at speeds up to 1.5M work support at Chase Manhattan Bank. "We are in a commercial envi-

Through AT&T's Customer Contrailed Reconfiduration (CCR) service, a tariff offering, corporate cus ers can determine the destination

announced last week to link up with Despite all the yack

powerful ers to devise by

(DACS), a central office facility that allows users to tie into AT&T servariety of voice and data trans

Whatever is the cheapest way to go. You have to be a smart shopper,"

Merrill Lynch typically uses TI

width at the point where a T1 terms nates on site and divert some chan-nels to WATS, some to 56K, some across country and some to premise HACS is the system AT&T uses to dyide TI tinks into 64K bit/sec cliannels, and it also serves as cus-

September or October. prenises DACS system because Timeplex. Inc. introduced Digital Access Exchange (DAX), a DACS fill fers that user companies utilize

in the black by the end of 1986

While telecommunications ma

ers at Interface showed no signs of is

to have no qualms about turning else where for the functionality tha

AT&T has so far been unable - or

unwilling - to provide. As a result, T1 exhibitors did a lively business.

"This year we're getting qualified buyers who will make a definite deci-

got more people who just collect liter

ature," said Codex Corp. regional dis

trict manager Larry Wallace "And

T1 products are high un many peo-

At this third postdivestiture Inter

a in a month or two; last year we

oring AT&T's booth, they appeared

"Niebank said.

We thought we could use CCR to

ts tariff offering CCR, according to Not only is CCR a profit source orgales said, but it also is part of AT&T's campaign to discourage cus

(IDS) announced its first DACS-con

Stiesbath Manualtt

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and B4000

The V 310-1 reportedly in

The V 310-2 features 10M

bytes of memory and ac-

cludes 5M bytes of memory

Designed operating system exclusively for new series

James Connolly DETROIT — Continuing a recent string of product in-troductions, Burroughs Corp last week annou

try-level system for its V senes of intermediate main frames and an operating system designed excitesively for that series The company, which

in previous weeks annced a large-scale A series mainframe and several mainframe and microcomputer comm nications products, said the two V 310 models will fit below the V 340 and V 380 mainframes it performance and can be field-upgraded to those

announced a systems year ago Analyst Steven Miles vich of First Boston Co. spec has done a good job of getting products out to their customer base in recent years. May

be they think the market is weak, and they figure that they can force the customers to start buying

Milimovich added that the announcements

Burroughs "well positioned to meet the customer demand en the market picks up later this year

Yankee Group Thomas Henkel noted that

the strong of Burroughs an nouncements is not unex For the past couple of

and can address eight data link processors that allow communications with periears, Burroughs has had a flurry of announcements in pherals such as printers and the spring, or at least during the first half of the year. It may just be part of Bur-

roughs' internal development

that Burroughs does a lot of

with the declining dollar

vantage of it because U.S.

The operating system an-

ced last week is named

heaper to buy overseas.

they may want to take

products are

However, he added, "One

ability to keep in mind is

rnational business, and

becoming

cess to 16 data link pro cessors. Both models can be expanded to include Burroughs really has done a good job of getting products out to their customer base in recent years.'

20M bytes of mer and access to 32 data link processors Burroughs said the V 210s include the same I O subsystem as the 340, transferring data to

peripherals with an 8M byte/sec, band pass No performance estimates

The company released no estimates the V 310, other than to say performance proved by 50% with an up grade to a V 340 and by 140% with an upgrade to a Based on those statistics and earlier industry observers estimates of the high-end systems, the V 310 will per-

form at 0.91 million instructions per second.
The basic V 310-1 costs \$160,000, and the basis

are set for July deliveries Burroughs also said the estems will support the unsly was available on Bur-roughs V series and B2000, same peripherals as the other V series systems as well as

o existing lower cost perioberals Those two peripherals are a 491M-byte MD-4 disk sub-system with an average access time of 30 msec and a 1/2 R0498 tane streamer operating at 25 in./sec average transfer rate of current current jobs and control 10,000 disks and 10,000 oth-

40K byte/sec. The new operating system reportedly allows the V se-

ies to address up to 40M bytes of memory, rather than the 5M-byte maximum allowed under MCPIX Early V series users re

ported last year that they ported last year that they had to use an interim solu-tion. Burroughs' Quik Disk to overcome the 5M-byte limit.

M-byte limit.
Company officials also ild an enhanced version of MCP/VS, Release 2, will be available during the third quarter of 1987 and will allow the V series to address up to 36 quadrillion byt mory, execute 10,000 con

er peripherals. MCP/VS Release \$800 per month or \$30,400 per year for V 310 systems: the system costs \$1,200 per month, or \$44,000 per year, which is the same price as MCPIX for V 340 and V 380

System failure halts trading at London Stock Exchange

By Stephen Arkell Computerword News Service

LONDON - The recent erash of a new electronic trading system at the London Stock Exchange halted op tions trading for a day. The crash has cast a pall

over the Stock Exch over the Stock Exchange Automated Quotes (SEAQ) system, which will be used for share trading when fi nancial services are deregu lated in London's financial ict in October

The failed system cor of five networked IBM Per Brokers found themselves sonal Computer ATs, with an additional AT as network controller. The system had been designed to cope with the increasing activity in ophe holder the right to deal in a share at a future date at to day's prices. The number of tions in traded on tions has grown from around 8,000 per day six months ago to an average of 23,000 a day

over the last month Matching buyers, sellers

The new system was du to take over the matching of buyers to sellers, previously carried out frame-based batch system at the London Options Clearing

The cost of the closure has yet to be assessed. The stock exchange's ruling body has now set up an official inquire into why the system lapsed and whether any safeguards are needed to prevent failures. Mick man, who is head of systems development at the exchange and is responsible for traded options system, refused to comment

networked crashed on its first fully live day when two more per

computers were added to speed data input. The number of transactions during the day had reached an ailtime record of 34,000 "The software was per-fectly all right," said a

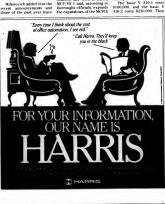
spokesman for the exchange But a hardware fault had developed in one of the ter minals when the matching run had been completed The fault locked up the net-work with the result that the market had to be closed clear up the backlog left by

unable to offload out-priced sure and are up in arms al "As far as I'm concerned it was a bit of a rash decision to take the b by the horns and go live before it was fully tested," one broker said, "We can't afford for things like this to ever happen again." The system hannen again. had been running in parallel with its predecessor far only three days before the deci-

on to go live was made Brokers were also co pianning about the lack of a facility for the sys which was originally specified three years ago. A spokesman for the exchange denied that there were any stion marks hanging ove "A corrupt terminal

bears little reflection on a finished system," he said. The SEAQ system, though much larger, has been de-signed to work along the same lines as the traded options system and uses th same local-area network. The London Stock Exchange has already spent \$63 mills

developing systems for the deregulation and raised an additional \$57 mil lion for development work



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PORTABILITY

SCI_US and DB2 run only on IBM maintrames: CRACLE runs on IBM maintrames, DBC, DG, AT6T, HP, Stratus, Sperry, Prime, Honeywell and several other manufacturers' minicomputers, and on a wide range of microcomputers including the IBM PC/XT and PC/AT. ORACLE runs under wondor-proprietary operating systems or under UNIX's All versions of ORACLE are identical and include a complete implementation of SCL—not a subset.

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On the connection of the co

Today, minicomputer uses public in the Schwert Daw Course paid Order Corporation as better number one weedor choice for 1986, ORACLE and the Course of the C

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The trouble with having so many Picks to choose from

Legal questions prove nettlesome

Maura McEnaney LAS VEGAS — Legal bat-

tles over alleged copyright infringements between Pick Systems and sellers of prodts relating to its Pick oper-

ating environment were on ating environment were on the minds of yendors and us-ers attending the Interna-tional Data Base Manage-ment Association, Inc.'s (IDBMA) Spectrum U.S.A. exhibition in Las Vegas last

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"The infighting in the Pick community has hurt the rep-utation of the system," said

Robert Clearfield, vice-pre dent for MIS at Delaware Val-Underwriting Agency. Inc. "The money that is being spent on lawyers' fees would be better spent on marketing

the Pick systems."

Known for its data base management capabilities and its portability across a range of systems, Pick runs more than 2,000 software applications packages, making it a popular operating system for

medium-size businesses. The operating system is licensed to 25 systems integrators, hardware manufac-turers and OEMs. In December, Pick Systems

sued Vmark Computer, Inc. of Natick, Mass., charging the company with copyright infringement and trade se-cret violations of the Pick op-

erating system In October, Vmark anunced an agreement with AT&T Information Systems to provide a Unix connection to the Pick operating system, thereby giving the users of Unix-based hardware access to the numerous business an

plications that run on Pick Pick developing Unix link Pick, meanwhile, is devel-

oing its own version of a ick-Unix connection and hopes to announce a similar link sometime this year.

indications that the suit could be settled out of

Corp.'s MS-DOS operating system. priced at \$495. The lack of standards ulation at the show that Pick is also reviewing the efforts ong manufacturers of Ever-On Corp. of Houston The company has a product that allows users to run Pick-

Pick-based systems was a major conference topic. Because each OEM licensee can enhance the Pick operating based applications on Tandem Corp. fault-tolerent ma-chines. Through the Vmark process, the Pick applica-tions run as a task of Tansystem in its hardware im plementation, some Pick ap plications may not run on all

software

dem's Guardian operating neric Pick," said Chandru Murthi, a San Franciscosystem Like Vmark, Ever-On is marketing its product without a Pick license. "They based consultant. And since haven't approached us on it." Ever-On President Randy Pick Systems has not moved to create a set of standards Jordan told Computerscorld thin the operating system, Although Pick Systems that responsibility now goes to its licensees. Murthi addexhibitors at the MGM Grand "We need a leader, and the leader is not Pick Sys-Hotel, the company used the show to announce Version 2

he said tems, The first set of standards for the Pick operating sys-tems was scheduled to be announced this week by the Spectrum Manufacturer's Association, a group of 16 man-ufacturers of Pick-based sys-



A HARRIS

Comdex Japan: Few systems

By Yasuko Yoshimi and Takehisa Kondoh

TOKYO - Many of the 20,000 visitors to the four-day Comdex Japan '86 exhi-bition held earlier this month were surprised to discover that far fewer computer systems were on display than at last year's first Comdex Ja-

of its operating system for

available in April and includes an applications gener

ator and a data transfer bridge between files created

IBM Personal Computer

Instead, vendors and dealers were emphasizing their peripherals, software and rked products at To kasa's Harami International

Exhibition Center Omron Tateisi, of Kyoto, Japan, used the show to an-nounce the Omronix, a Japanese-language version AT&T's Unix System V.

Simple, Inc., a firm closely tied to U.S. vendor Fox Research, Inc., showed its 10-Base III software, which it calls the "first multiuser-oriented relational data base ever in Japan."

Some 50 compa out local-area network and value-added network prod-

California teens charged with credit bureau hacking

Police bait suspects with hot hardware

By Jeffry Boeler SUNNYVALE, Calif. — Police in

ly nabbed a band of youthful hackers who allegedly broke into a major credit bureau's information system and used stored information on cus tomer credit lines to fraudulently computer hardware

All of the suspects, ranging in age from 14 to 18, were apparently users of an underground electronic bulletin hoard from which they obtain password and access codes for TRW,

Operated by TRW's Information Services Division, the system uses an IBM 3084 Model Q and a 3033 Model AP to maintain confidential credit histories on some 120 million Ameri-

The intruders also obtained several of their neighbors' private charge account numbers by fishing discarded credit card carbons from garbage bins at local shopping centers, ac-Sunnyvale Public Safety Depart

Using Commodore Business Ma-chines, Inc. Model 64 and Model 128 home computers, the youths allegedly gained unauthorized access to cardholders' TRW-stored financial ords and noted their credit limits

and current account balances After deciding how much merchandise they could safely charge to each account, the backers used the stolen credit card numbers to order at least one \$1,700 IBM Personal Com-

puter over the phone, Seely said Following the arrests, investiga-tors informed TRW of the suspected breach of its systems security. Thus far, however, police have released no evidence to support their suspicions

other than the hackers' own boasts. according to TRW spokeswoman Dehis Fernandez

dice have not ver

When we asked the police whether they had recovered any TRW pass words from the suspects, they said hey hadn't." Fernandez said. "They they hadn't," Fernandez said. also told us that they hadn't called up any of the telephone numbers in the kids' possession" to verify that they correspond to the firm's main

Seely acknowledged the se Fernandez's ciaims but defended the police maction. "During our investigation, we've discovered the phon numbers to a lot of other companies computers besides TRW's, and we computers besides IRWs, and we haven't had someone working full time to check them all out," Seely said. He flatly denied assertions that police had failed to find any TRW

On March 20, TRW dispatched tw of its security experts to Silicon Val-ley and offered to help police with their investigation. But the offer was refused on the grounds that all the suspects are juveniles. "We were really shocked by the police re-sponse," Fernandez said, "This is the first time that our assistance has

ever been declined Suspicions that TRW's system may have been a recent backer target first became aroused when one enagers' neighbors notified police me delivery of a personal computer he denied ever ordering.

Rather than return the unwanted hardware to its source, police left the parcel by the neighbor's doorstep concealed themselves and waited to see if anyone would claim it.

Within hours, their ploy had neted them two suspects, both local high school students, who were charged with grand theft and posse sion of stolen property. Soon after-ward, nolice arrested several other

Former federal employees guilty of rigging computer contract bids

Mitch Betts WASHINGTON, D.C. — Two for mer computer managers at the U.S. Postal Service have been convicted by a federal jury of operating a mas sive bid-rigging conspiracy involving \$2 billion worth of federal computer

oltz left the Postal Service in 1977 to perform consulting and sales work for various computer vendors. He for various computer vendors. He then conspired with Franklin W. Jackson, head of the service's office of financial planning and systems

from 1976 to 1983, to steer government contracts to Perholiz's clients. The jury convicted Jackson and Perholtz, former general manager of the Postal Service's accounting division, of racketeering and mail fraud The jury also ordered Perholiz to pay back more than \$850,000 that the government said he obtained illegally

through the bid-rigging scheme. The verdicts, issued March 14 in U.S. District Court in Washington, came after an eight-week trial for what prosecutors said was the larg est procurement fraud case ever tried in the nation's capital. Sentencing is

cted next month Prosecutors said Perholtz and ekson orchestrated a complex web of kickbacks and bribes - including a Florida condominium and a \$45,000 boat — channeled through real and

ocurement process Postal inspectors became suspi

Postal inspectors became suspi-cious when they discovered that Gregory W. Fletcher, a Perholtz asso-ciate who helped design three sepa-rate Postal Service computer sys-tems, owned a Florida condo with Franklin Jackson, the Postal Ser-

computer projects.

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Houston last showplace for floundering OAC exhibition

May be combined with another meet

Donna Raimondi HOUSTON - The Office Automation Conference - which made its last week.

The thinly populated conference went out with a whinper minus exhibi from some of the industry's acknowledged leaders in of fice automation, such 86 Wang Laboratories, Data General Corp. and Compaq Computer Corp. al-

participants, few vendor

ees at several sessions and on the exhibit floor were OAC's host, the American Federation of Information Processing Societies, Inc. (AFIPS), has decided to roll the OAC into a broader conference format after surveying the exhibitors and atyears, said OAC spokeswor an Katherine Stormont. The OA tag limits the scope of the show, she said "To keep up and move with office automation technology, we would

llike tol open up the confer-

of automation, such as home

nce to include other forms

AFIPS is considering roll-ing OAC into the Business Systems and Applications Conference (BSAC) scheduled for March in New York. Another option AFIPS is con sidering is merging both BSAC and OAC into its NCC Telecommunications scheduled for September in

Philadelphia. A final deci sion will not be announced The difficulties that will fice systems from other ma lead OAC to its future inclu-Wang and DG, she said sion in other shows instead of warranting its own were evident in the variety of

opinions expressed by speak-Rod Canion was the keynote rs and attendees. Despite claims by the ring organization that the show registered 15,000

Compaq's Canion declared that there was "no possible alternative" to personal com puter-based (specifical IBM and IBM-compatib (specifically based) office automation. Minicomputer- and main-frame-based OA systems are limited and monolithic, he said, requiring users to

> their jobs. But the OA picture is not that limited, said Patricia

> > We would [like to] open up the conference to in-clude other forms of automation,

factory.

- Katherine Stormont Sevbold of Patricia Sevbold's Telecommunications confer-Office Computing Group in Boston. "If you want to netsaid Judy Slattery, marketing services manager work PCs, go with other ven-A lot of the people stopping by are Houston based, so its like a regional show this dors," she said, "but if you want to use minis with office systems, go with DEC DEC's All-In-One office

orte IBM PCs better than ofini makers such as pull from several vendors and put together the best the Compaq," said Jim Huse of Primary Fuels, Inc. of they can make, said James Goodman, a show attendee who is manager of in-Houston, who got a pass from formation systems and plan-ning at RCA Labs, Inc. in

rinceton, N.J. He said it is not necessarily up to the ve Neither of those vendors exhibited, so Huse could not dor to know what each cusfind a solution to his proble The software, hardware at OAC. Foiled in his search. and support has to be tai-lored," Goodman noted. Syshe decided to look for an optical character recognition scanner and could locate only tem integration is important but customers cannot rely on two vendors with that prod the vendors for that, he as "I don't believe I will go ed. His predominantly IBM shop uses both DEC's mini-computer-based All-In-One to the show again " he add

Kathy Teter, operation analyst at Houston-based Marathon Manufacturing which makes offshor oil rigs, came to the show looking for software for her IBM Personal Computer ATs

used for word processing "I'm disappointed in the number of booths," she said Teter would probably not journey to New York or Philadelphia for another version of the show, she said.

"It has definitely become a regional show," said Hon-eywell spokesman William McCree. The number of ex-hibitors and attendees has subsided in the last three years, he said, and Hon-eywell will review and con-

1980 debut in Atlanta took its final bow in Houston though Compaq Chairman IBM DRIVING YOU CRAZY WITH SDSF??

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A HARRIS

more powerful applications, Seybold claimed that the seyood claimed that the end-user element of comput-ing is more important than all the new technologies and features becoming available. In five years, she asserted, most strategic business ap-

and Apple Computer, Inc.'s Macintoshes for OA applica-

Future innovations in OA

will come from adoption of

local-area networks, an area where no vendor is yet pre-eminent, said Michael Alsup,

program chairman of OAC. Alsup is an office automation and image processing consul-tant at Arthur Andersen & Co. in Houston. Innovation

will be in network manage-ment systems and builders of

tween end user and MIS staff, with the MIS people taking responsibility aining user written ap attend OAC when it is rolled into another show, vendors change the way they perform and attendees alike took wait-and-see attitude. "We will have to see what it evolves into and if we can reach the kind of people we want to reach," said Apple spokeswoman Rence, Rodri-

plications will be written by the end user at the depart-mental level, leading to an

'absolute role reversal'

was exhibiting third-party desktop and communic software, was one of the busiest at the conference. Another booth with a good draw was Soft-Switch Inc. of King of Prussia, Pa., a leader in the document conversion market. "We would be more apt to go to OAC again if it were rolled into the NCC

que. The Apple booth, which

e a regional show this indeed, many of the attendees got into the show with free passes from local computer stores. Even for e, some were disappoint-"I came here looking for Compaq or Wang, because we have had problems downloading from our Wang VS to

Won't go to show ago

OAC before committing to fu-

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VIEWPOINT

EDITORIAL

When confusion reigns supreme

One early symptom of enfeebled regimes is a muddle of wurd and deed that evinces an internal confusion of purpose to the outside world. While IBM may not be toppling, it has lately displayed all the confusion of the feeblest of downed oligarchies.

The most revert evidence was last weeks amountement of the PC-198-3 governing system upgrade, an operating system for a network architecture that IBM amounced five morths again and that supports a 30-in. The amountement was made in a letter to authorized IBM dealers on March IB, with no findrare and few details. In fact, when a spokesman for PC-100S vendor Microsoft Corp was contacted a few days later, he re-Corp was contacted in the ways later, he re-Corp was contacted in the way of the contact of the way of the wa

to refuse comment and to refer all inquiries to IBM. Not that IBM was much better prepared to deal with questions about 3.2. A spokesman was able to provide names of new commands but he uffered few details on what the com-

mands did or what benefits they held for users.

All clear? True, IBM has not actually shipped its Token-Ring network, and it is supposed to introduce a 3½-in, drive product sometime soon, but still.

IBM has never been one to growt before user demands. But the rules of the game have changed. Users are more sophisticisted, hence more demanding between the good of the costs to solve them are beginned to the costs to solve them are beginned to the costs to solve them are beginned to the total to solve them are beginned to the good of the g

and its public image.
PC-DNS-32 may well be a splendid precursor to a brave new world of IBM computing.
Nirvam may be ours on April 2, 8, 15, or whenever. May be. Meanwhile, there is muddle and confusion if there is no change, the risks and the consequences are greater than ever before Even for IBM.

Notes & observations Popular videotex services may not have

expired completely with the recent discontin uation of offerings by Knight-Ridder News-papers, Inc. of Miami and the Times-Mirror of Los Angeles, but they certainly received what in sports is called a careerthreatening injury. These two media giants both attempted to sell the public expensive in home interactive information SETVICES without first ascertaining whether the public had the slightest interest in these services Now both companies have apparently failed at considerable financial loss. While we take some comfort in the free market having once again dealt effectively with a supply hich there was no demand, we believe that there is an important and implicit message here for all technology vendors: You do your selves and the user community the most good when you satisfy a real and urgent applica tion need



LETTERS TO THE EDITOR

More cheers: Pick operating system

1 would like to join with the writer of the letter,
"heke of the operating system litter" [CW, Peb. 17],
in his praise of the Pick Systems." Pick operating

system.

I have been using Pick on various machines for over nine years, from its original implementation on Microdata Corp. computers. The Pick operating

on Microdata Corp. computers. The Pick operating system is exceedingly capable, flexible, powerful and easy to use, but why don't we see more about it in the press? Pick was "relational" long before it was deemed a good thing to be so. It was built with a nonprocedural outer, landuage as an inherent out of the

system, not as an extra cost option.

I have worked with an application that was transported under Pick from a time-sharing system down to an IBM Personal Computer with a bare mannum of program changes. This same application is currently being run and supported on computer systems from four different vendors within the same time-sharing service I doubt that

computer systems from four different vendors within the same time-sharing service. I doubt that under any other operating system—even Unix—these could be cost-effective options.

So please leave Unix where it belongs—in the lab. Let's hear more about Pick. It is a proven oper-

ating system that was designed for use by business. Michael Gwinnell Business Computer Installations

Ada one of programming's Edsels?

And of the day as a going the way. Units had exposure to Multics, there is nothing, it of the Sergeant York gan, along comes someone to Units to estore to Multics, there is nothing, it necessare us that, yes, it is indeed allow and well in which Darw as or a significantly written ledded the page the article "Adia. A better choice" [CW, Peb. 10], in gand segmentation capability required to imple Unfortunately, 10 found nothing to indicate that we meat a unified storage/lie system; yet the single

can make a silk purse from this sow's ear.
Ada's credentials are simply not impressive.
Efficiency? The results have been extremely encouraging, the writer claims. Yet this assertion is followed with benchmark tests against Pascal and C — languages not heralded for speed. Had the writer tested against BAL or Cobol and been able

to make the same claims then we would have something. But Pascal?

Another criterion was the quest for better portability. Acknowledging that portability has been an industrywide problem sine: "the second com-

puter was invented," the writer apologizes for Ada's inability to perform better than other lanmoved successfully between then hardware coningurations, but the writer meekly ends by saying that the time frame for the conversion "would have been unachievable had any other language been used." Did he writer attempt the same conversion with code in other language; And if so, version with code in other language; And if so, y sanitud for this test?

I am not convinced that Ada is a better choice; it is only one, which, industrywide, adds yet another tier to the programming Tower of Babel.

Steven Rosenber Presider FF High-Values Computer

What the world needs now is Multics A recent letter to the editor "'Fan' defends the virtues of Multics" [CW, Feb. 3] understates the severity of the loss that Honeywell. Inc. has caused

virtuge of multies [c.w., rev. 3) understates the we'rity of the loss that Honeywell, line, has caused by withdrawing support for its best operating system, Multies.

Although the technology underlying Multies is two decades old, not a mere 15 years, it has still not been absorbed into the mainstream. Vendors, including Honeywell, show no sign of adopting the

including Honeywell, show no sign of adopting the more important functions of Multics for release in three to five years; in fact, they show no signs of even being awar of those functions. Unx is not based on Multics. Although the people who implemented the first few versions of Unix had exposure to Multics, there is nothing in Unix to show that. In fact, the architecture

ment a unified storage/file system, yet the single most important feature of Multics is the integration of the virtual memory with the file system. The reader who is interested in what he is missing can get an overview from the Multics Tupers in Section 6 of the 1985 Pall John Computer Conference American Federation of Information Propublished by Sparran Books and Macmillian and Co. No other system comes close to fulfilling the design goals set forth there.

Seymour J. Metz Annandale, Va.



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VIEWPOINT

Finding future managers: Cutting through the hiring freeze

By WALTER F. CUIRLE

iring a new person has never been a simple matter, but in the last few years it has beeven more complex. This is par ticularly true in large companies that have adopted hiring freezes or similar policies that strictly limit the cir-cumstances under which you can bring on a full-time employee. In many cases, the hole in the hiring policy that lets you staff up to the ers you need is the pen to hire contract employees on a tem-porary basis for a particular project. ntage of this ap proach lies in its potential for disrupting the continuity in your d mental management family in the past, when virtually everyone on the staff was a full-time employee. of proven short-term technical abiti ty with maybe the promise of mar ent potential, then offer a few re demanding assignments over the next few years to see how th potential might develop. Eventually, if you got a good response to those test assignments, you might tap the

person for promotion

If having limitations have been in force for any length of time, you probably have a much smaller pool from which to choose your future supervisors and managers. The pool is smaller because the number of full-time corporate employees to your de-

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mour. Pa. partment is smaller and it is from this group alone that you must choose your future leaders. The net result of this situation is that, when you are allowed to hire, you have to be a lot more cautious about whom you hire and particularly why you hire them. You must keep

ly why you hire them. You must keep a fresh supply of management talent on hand, a need that becomes greater the more restricted you are

in your hiring, if you are faced with hiring limitations for an indefinite length of time, then every new hire is potentially on a management track from the first day. In consequence, you may want to set different profities on the qualities that the contract of the cont

proven assay in both areas. Does this mean that a new MBA is always preferable to a seasoned systems analyst? No, but it does mean that you have to sit back and think about just what you mean by "seasoned" and just what it is you think you are buying when you require a particular flavor of college degree. Seasoning is not just a matter of years of experience. It is more a matter of variety in the job than time on

The questions you would need to ask are straightforward, and you have asked them before: How many maintenance projects? How many development projects? Any experience in working directly with end users in

You can assay management ability in a similarly indirect manner in an analytic politic manner in an analytic with a similar politic po

MANAGEMENT MATRIX

Can assume that those promotions into of someis for an indefithing, but you have to find out what hen every new that something is. Three promotions

thang, but you have to lind out want than the control of the part of the control of the control

mean little or nothing, look at how the job was handled. What was the basic job description? What did the cardidate do, or want to do, that went beyond those requirements? How was it done? The thing to look for here is the development of an idea and the sale of it to manage.

ment.

No matter what answers you get to those questions, there are other places you should look for the abili-

ties you want. Participation as a volumer is often a tax-ditch question saked to gauge the initiative of entry-level candidates. It should not be it is an equally valuable indicator in experienced candidates as well. For example, membership in one or more of the recognized professional organizations is laudable but fairly ordinary however, if your candidate has reliable to the proposed of the pr

Another area to look at he education, both formal and continuing. A programmer with a B.A. In philosophy and two years of experience who also worked for one of the professional technical continuing the second soul technical continuing the second as B.S. in mathematics with two years of experience who has done nothing outside the basic job description. Regardless of your opinion of the instrusar value of the certificial, you have tailing to the certificial, you have tailing to get one.

Finally, talk to the references Good references from people who recently worked with or under your candidate are more useful than references from the programmer at the next desk in the last job. If your candidate ran a project, references from end users of that project are very useful indeed.

t useful indeed.

When you have finished all that,
and are satisfied, ask one last quesation — this time, if yourself. You
have before you a candidate with talent, goals, initiative and the willingness to take on responsibility a this
someone you could be comfortable
with as your supervisor.

Comecon countries struggle, look to the West for high-tech expertise

By DOMINIC IMONTI

I recently returned from a trip to lungary, meeting with the Deputy Minister of Trade and Commerce and the key managers of Metroplex, which handles all the computer peripherals activities in Hungary. I was there at their request to review the state of their technology and their capabilities. They are seeking a role in eventually manufacturing for the Western work.

The lungariams are loaking for opportunities to neglicitie mounterfacering diceases for older technology in the large state of the large state of the receiver of the large state of the large state of the large state of the large state of the state of the large state of the large state of the state of the large state of the large state of the state of the market within the Gouncil for Hustian Recommend. Assistance for for Hustian Recommend. Assistance for the face tremendous problems, problems that may in fact the insurmountable Pfras, their technology is at least erral factories and production facility.

Imonti is vice-president, marketing, for Pertec Peripherals Corp. in Chatsworth, Calif. they had to offen we have conble to the same of the conble to the contraction of the conposition of the contraction of the contraction of the conposition of the contraction of the co

head-per-track drives, it was clear that they do not have a capability in that area. Of course, we evolved away from the head-per marketing program

evolved away from the head-pertrack concept 10 years ago, and yet that is a capability they are proud of today.

The Hungarians are extremely

today. The Hungarians are extremely vertically integrated, trying to do as much of the manufacturing from raw manufacturing the second of the manufacturing from raw manufacturing from raw manufacturing from the vertical integration, chain is extremely show, and depending on the availability of raw materials and the number of two materials and the number of products it amenifable at best. The cheapest commodity they have is labor they pay, considering all the deflections, about 50 ptoyee, And yet the avilage on labor playee, And yet the avilage on labor the surging on labor them.

cannot make up for the systems and technological deficiencies they face. Probably the biggest obstacle the Comecon countries face is their lack of understanding of the concepts of competition and marketing. In order to work with the Western world, these tenets of our very structure and business life must be well undertunded. And they are not. Pro-example.

these tenets of our very structure and business life must be well understood. And they are not. For example, the need and the importance of providing ongoing service and support to their cus-

preciated. The need to develop a marketing program, including advertising, public relations and collateral concept of competition is not one with which the Comecon manager is familiar. Business success is based more for them on achieving the necessary directives and waiting their curr in inne than it is on staking out a market or selling the consumer on the value of Brand X over Brand Y.

Even the labor force suffers from the lack of competition in the environment. The incentives for excellence are weak. To many, their goal is to minimize any potential conflict and perform just what is expected. There really is no place for the entrepreneurial spirit that is so prevalent

in the Western world — particularly in our computer industry — and that is so clearly responsible for the ket atrong business growth we enjoy. of Even if the Comecon countries er could overcome these obstacles, one wonders how great the trust level

could overcome these obstacles, one wooders how great the trust level can be when actually doing business with them. If I sign a contract with some company in Bulgaria, Bungary or Poland, how long will I get product support! If they fall miserably, and I go into the courts in Poland, for example, what recourse do have?

It seems that the basic political sociological and technological struc-ture of the Comecon countries is so different from that of the Westerr world that, in order to succeed, they will need to hire Westerners to do the behave the way their current labor pool and managers do. If they hire esterners, they will lose the ability to control, and that is a fund problem for them. Yet how can they work with a society as different as ours unless they are able to better un erstand us, to work within the orid the way we know it? They will oeed to become a more open, spirited free society themselves in order to understand what makes us tick And that seems to be a far greater chal lenge than simply modernizing their

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SYSTEMS & PERIPHERALS



A tough act to follow

wo years ago, a person might have thought the battle for the tape drive business was won. IBM finally had announced its longawaited 3480 cartridge drive and had frustrated its competitors by offering a few unexpected, tough-to-imitate fea-

IBM had the head start in a market where it already dominated the proces sor business, and the 3480 business soured. There was, and remains, little doubt that 3480-type technology is des-tined to control the high-end, off-line storage market.

But the question remains whether even the 3480 can prove as durable a market force as was its predecessor That predecessor was the IBM 3420 reci-to-reel tape drive technology, which was a standard for 16 years and was implemented as recently as early was implemented as recently as was March in IBM's newest tape drive, the

The longevity of the 3420 beca more apparent in a recent Com world feature story about how data centers are migrating to the 3480 [CW, March 24]. That article quoted Interna al Data Corp. estimates showing mpared with 12,000 3420s and 3420-mpatibles sold. It is true that the 8,000 3480 sales represent a greater storage capacity than the 12,000 reel-to-reel drives, but that 12,000 figure rates how strong the 3420 h been. IBM seemed to recognize that strength with the 3422 announcement in which it targeted that machine for in which it targeted that machine for IBM 4300, 3080 and 3090 mainframe sites where management has opted to See TOUGH page 21

nolly is Computerworld's senior editor, systems & peripherals.

Transition to 3090 runs without hitch, bank says

By James Consolly
BOSTON — The first users of IBM's
3090 Model 180 mainframe reported last
week that installation and the changeover
from diagnostics to production mode ran

The Shawmut Corp., a Boston bank, received the uniprocessor system on March 17, a little more than a month after the

system was introduced by IBM. The instal-lation took less than a day, and the changeover to production was completed

the following weekend.
The Model 180 replaced an IBM 3083 as Shawmat's on-line production system, serving 1,700 terminals and 400 automated teller machines. The 3083, in turn, will replace an IBM 3033 as a development and

replace an I batch syste Get the box in and then move the I/O

"It is not much faster than the other nachine yet, because we do not have the l. O configured the way we want it, although

Sun Microsystems announces high-end, gray-scale workstation

Rosemary Hamilton MOUNTAIN VIEW, Calif. — Sun Micro systems, Inc. last week added a high-end, gray-scale model to its Sun-3 workstation line. The product will compete with Digital Equipment Corp.'s gray-scale model of its

re. The Sun-3/160G, with an entry price of rne sun-3/180G, with an entry price of \$29,000, was designed for such applica-tions as technical publishing, mapping, im-age analysis or any job that needs distinc-tive shading but not full color. It costs about \$3,000 less than the DEC worksta-

Atex. Inc. said it plans to use the model in its Publication Design and Ad Placement product, which is used for interactive page and display advertisement makeup. Int leaf, Inc., a Sun OEM, is testing the model and looking into the possibility of reselling

some jobs are running noticeably faster. What we wanted to do first was get the box in and then move the I/O as needed on weekends," said Shawmut Assistant Vice-President Richard Mulcahy, who is in charge of hardware planning.

He said that to speed installation of the

ainframe, the new system was installed asing the same basic wiring that ran the

According to Mulcahy, the only snafo encountered during installation was a rela-tively minor cabling problem in the coo-

tion of an IBM 3880 controller, which Shawmot had planned to add to its sys-tems even in the event of a 3090 acquisi-Mulcahy said the company laid out its 3090 system in a way that will allow mini-

mai realignment of computer room peri-pherals if Shawmut decides to upgrade the Model 180 to a 3090 Model 200 dual proor or a Model 400 quadratic processor

it, said Jim Ricotta, Sun product manage The workstation, which operates under Sun's version of AT&T's Unix System V, is based on the Motorola Inc. 68020 micro processor and comes with a 12.5-MHz Mo-toroia 68881 floating-point coprocessor and 4M bytes of memory, which is expand-able to 16M bytes. It can be used as a disk-

less node on a network or as a stand-alone system with local mass storage. Mass storsystem with local mass storage. Mass stor-age is available in disk and tape configura-tions from 71M bytes to 1.5G bytes. According to Ricotts, the Sun-3/160G is similar to other workstations in the Sun-3-line, with the exception of its black-and-

duled to ship in May.

white monitor that produces 256 shed It also includes the Sun Graphics Processor board, which was previously avail-able only for color workstations. It is

INSIDE

Sperry offers two optical disk storage systems/24

3M introduces a 35mm laser film plotter for computer-aided design systems/24

NEW THIS

■ Digital Equipment offers the LG family of printers

- Wespercorp an nounces the TDO-OIC tape coupler
- For more on these and other new products, see 00 73.83

INSTANT "With corporate

profits under pres sure, a lot of mainframe orders are being pushed off until later in the year because DP is still seen as a cost center. DP spending will pick up by the end of

the year."
-- Staven Mill

Elxsi cuts prices on multiple-processor configurations

Discounts intended to spur parallel processing

By Jeffry Beeler
SAN JOSE, Calif. — Elxsi has
slatised by up to 50% the per-processor prices of its multiple-CPU configurations. The cuts coincided with the packaged systems

in the wake of the recent an nouncement, Elxsi is now offering its existing processors in four-CPU and two-CPU versions. For the four-processor package, the price is almost 53% less than what a user organiza-

number of machines individually.

Por a dual-CPU configuration, the per-unit price cut totals almost 33%.

In reconfiguring its existing processors as packages and selling them at discounts, Eixsi seeks to stimulate user demand for its multiple-CPU

Think in terms of parellel pro "What we're really after is to ge er customers to think in terms of

parallel processing," said Gene Am-dahl, chairman of Trilogy Ltd., Elxsi's parent company. "Obviously, you can't get them to think of parallel processing if they're buying only on

To date, single-CPU configuratio

have accounted for roughly half the firm's hardware sales by volume, activated the hardware sales by volume, activated for the factorial for the hardware sales and the factorial for the factorial factorial for the factorial for the factorial fact

President Peter Appleton-No choice but to buy separately

Previously, users had no choice out to buy Elxsi machines separately

for \$369,000 each, Appleton-Jon

Pounded in 1979, Elxsl supplies commercial users with scalar minisupercomputers for complex scientif to 12 of the vendor's System 6400

machines can reportedly be coupled to form configurations that execute a total of 72 million instructions per In addition to supporting both parallel processing and multiple-proces-

sor operations, the 6400 is said to be expandable linearly. According to Elast, two CPUs working in concert offer twice the power of just one ma-chine — a capability most conven-tionally designed mainframes lack.

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fanagers can lack what if analyses, Sales reps can track leads and retrieve customer





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We just lost Pittsburgh! Where's the datacomm manager?

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ticated networks that offer

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plus eliminate costly downtime by automatically

rerouting data. Control yourself. Take the first step:



Prime offers graphics terminal, enhanced Medusa software

Tektronix-based PGT 4111 features 16 available colors

Rosemary Hamilton NATICK, Mass. — Prime

The Interactive Shaded Viewer module that lessena Inc. recently inthe steps involved to create troduced a graphics terminal that is said to have similar different shades costs \$6,000 for use on Prime's office sysfunctionality to its high-end graphics terminal at half the

The company also released a new version of its Prime Medusa computer-aided de-sign and engineering soft-ware. Both products are

available now.
The PGT 4111, Prime's third Tektronix, Inc.-based terminal, sells for \$12,950, compared with the starting price of \$25,750 for the PGT

Displays 16 colors

The PGT 4111 displays 16 colors, compared with the 256 colors available in the DCT 4125 The DCT 4111 was designed to work with Prime's Series 50 minicom-

puters. The terminal supports Prime's Medusa software for two-dimensional and threedimensional design, includ ing the latest version, Revi-

The new version consti of four new modules and added features, including one

IBM 1M-byte units replace Series/1 line

By James Connolly RYE BROOK, N.Y. — IBM upgraded the minimum mem ory of its Series/1 4956 processors by replacing four models that offered 256K bytes or 512K bytes with 1M-

byte versions.

The company said the IMbyte versions cost the same as earlier versions and that no changes other than memo ry capacities were made in the modular, communica-tions-oriented systems. The new configurations will allow some models to use up to 2M bytes of memory. Models BOO EOO GOD and E60 are

being replaced by the Mode B10, E10, 61D and E70. The prices for the units range from \$12,500 for a 1M-byte, 13-slot, full-rack B10 to \$20,500 for a 1M-byte, six-slot E70 with a 60M-byte disk drive, IBM said existing orders for the older models will be upgraded to the new versions without charge and emory upgrades for in

ms cost \$3 500

module for an interactive shading process and three modules that provide interfaces to third-party design packages

tems, the 2350, 2450 and 2655, and \$9,000 for the company's larger systems, the 9655, 9750 and 9955.

Each-interface to thirdparty software packages office systems and \$5,000 for The software packages in-clude the PDA Engineering. Inc. Patran-G, the West Ger-

man firm Ikross Femgem fi-nite element analysis tools and the Ford Motor Co. Product Design Graphics System.

The module prices are in addition to the base price of Prime Medusa, which costs \$20,000 for office systems and \$35,000 for larger sys-

The company also added an interface that tightly couples the design software with Prime's operating system,

Primos, a spokeswoman said. The PGT 4111 is based on a 19-in. color raster scan display screen with a 1,024- by 768-pixel resolution, com-pared with the 4125, which provides 1,280- by 1,024-



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3M laser film

plotter said to

speed CAD

By James Connolly ST. PAUL, Minn.

Corp.'s Engineering Syste

Division has announced a la-ser film plotter designed to

speed distribution of comput-

er-aided design (CAD) draw-

ings to remote locations.
The Model 2900 CAD film

piotter takes digital informa

tion about an on-screen de

SYSTEMS & PERIPHERALS

Agreements with

Filenet, Hitachi

By James Connolly BLUE BELL, Pa. — Sperry

Corp. has announced two deals under which the company will sell optical disked storage systems, one an image-processing system and the other a mainframe orage subsystem. Sperry and Filenet Corp.

recently signed a remark ing agreement under which Sperry will sell and support Flienet's document image processor system, a jukebox style optical disk storage de

Sperry said it is also offering the first product of a marketing agreement with Hitachi Ltd. under which Sperry will sell a Hitachimade optical system for use with Sperry's Series 1100

Sperry inks deals to sell optical storage units

with each other because the Hitschi device will operate as a Series 1100 peripheral - working with magnetic storage devices - and not as an image processor, accord-

ing to Sperry officials Filenet previously distrib uted its system through di rect sales offices in the U.S. and internationally through

Ing C. Olivetti & Co Sperry said it will sell the image processor in industries served by its National Ac-

counts Division, including the U.S. energy field, commulogos, the AT1183 represents the first time the firm is marketing a terminal under its own name, noted Jim Taylor,

product support augervisor

The AT1183 is being market-

ed through Data Access' network of resellers and via its direct sales force to end us-

At \$1,495, the terminal, according to Data Access, is

nications, airlines, trucking and scientific and engineer-ing industries. Filenet will seil the system in other mar-

The Filenet system is an integrated system that was designed to allow paper-intensive departments of large organizations to store and retrieve document images and

with a flow of electronic Sperry officials said an en try-level Filenet configura-tion will cost about \$300,000 and that a typical configura

tion supporting 12 worksta ill be priced at \$500,000 The Hitachi device has a capacity of more than 2.6G bytes per platter and allows

market. The unit's 9-in. by

12-in. footprint makes it the smallest terminal emulator available to Burroughs' us-

ers, the firm added.

The AT1183 features eight host- or user-defined

ord-protected func

tions: 4K bytes of user-pro

ory; autokeyboard lock,

grammable and nonvolu-

domly or sequentially. That on-line system will be availring the second quarter of this year in two ver sions that use the Model 5071 optical disk controller and the same software — the Model 8564 library mecha-nism and the Model 8562 manual unit.

The 5071 controller costs \$36,000 for single control and \$62,700 for dual control. library unit \$110,400 with a single drive and \$135,960 with a second

> A single-drive 8562 costs \$50,400, and a four-drive system costs \$127,080. The charge for the basic software is \$11,600 and is \$3,229 for optical random read soft-

with a protocol converter

rotocol converter can range

sign from a workstation and produces a 35mm aperture card with the design on film and identification data punched on the card. The card can then be mailed or hand-carried to a remote site, 3M officials said. The system has the poten-

tial to replace some plotters and processor cameras, in-cluding 3M's own 2800 processor camera, in some busi-nesses, a 3M spokesman said. The punched aperture cards

with the attached 35mm slide can be processed in pollable screen addresses with four independent disers and duplicators play buffers.

Available from stock, the The system reportedly al-lows a typical C-size drawing AT1183 is also being offered

to be imaged, punched and printed in less than two minutes, compared with the sev that enables the terminal to operate in an IBM 3278/3178 eral hours or days that the The Model 2900's dimen-sions are 38 in. by 56 in. by environment. Price of the from \$1,000 to \$25,000, Taylor said, depending on how much work the individual

24.5 in. The system will be available in September for \$65,000 to \$75,000

Data Access designs, markets own terminal

By Atan Alper BLACKWOOD, N.J.

Data Access Systems, Inc., a national distributor of comnuter products and services introduced the first product that it designed and is selling under its own label. The unit emulates Burroughs Corp and Visual Technology Corp

Although Data Access has for years developed products marketed under other firms'

A tough act to follow

stay or has had to stay with

tise only 132-col. display in reel-to-reel technology, even if the 3422 is to run along-

Now, the 3480 has moved to the head of class. However, the nature of high tech-

nology may limit its reign. The 3480 has been avail-

HIGH SPEED DATA ENTRY using the IBM-PC DATAFLOW

with a programmable timer for up to 255 minutes of inactivity and four independent able for little more than a year. It is still in its vanilla form, lacking an autoload

feature that analysts say could appear at any time.

The unit has also yet to see any competition from ping-compatible manufactur-ers (PCM), several of which claim they will have better

products out within a year The expected migration o the 3480 to amaller systems ion of is still in the develop stage, and users are still try-ing to figure out whether they want to transfer thouto of 3420 reels of data

onto 3480 cartridges. But other vendors are already promoting alterna-tives to the 3480, ranging from interim systems such as Memorex Corp.'s 6520 tape Memorex Corp. 8 6520 tape caching processor to next-generation products such as optical disk storage systems like the 2.6G-byte system made by Hitachi Ltd. and of-

fered in the U.S. by Sperry With optical disk technol ogy (a technology some skep tics thought would never reach the data center) already knocking on the door and technologies yet to be magined likely to develop, it

customer requires may be impossible for the 3480 ever to match the 3420's 16-year dynasty. At today's technological pace,

we could see two or three new kings of the mass-st age market before the year



COMMUNICATIONS



Packet-switch perspective

udging by the flood of sales, mar-keting and technical discussions, one might think that packet switching is pervasive and ubiquitous. This column tries to put the long-dis-tance data transmission technology in perspective and to raise some issues potential users should examine before committing themselves to a packet

system or service First of all, packet switching is far First of all, packet switching is far from ubiquitous. 1885 revenues for the top 10 U.S. packet-switching service companies only came to \$250 million, compared with the \$414 billion overall U.S. communications expenditures for

The technology is excellent for a

narrow set of communications require-ments: highly dispersed, low traffic and bursty, asynchronous data streams. But it is problematic for synchronous traffic, for transfer of files and graphics data and for digitized voice

There are also problems that the cket-switching industry is gradually olving. One has to do with transmis elays that arise because packets typically have a minimum length of 128, 256 or 512 characters. This arrangement means a packet cannot be sent until enough characters accumu-late. A packet is like a bus that waits to be full before it departs, clearly a taxi ould be faster because it can leave with only one or two passengers. See PACKET page 27

Minoli is a lecturer with New York University's Information Technology Institute as well as a full-time date communications researcher and strate-

Ohio Bell packet service out

Local phone firms offer extras as regulations ease

By Stanley Gibson
Traveling a path that other divested Bell operating companies may soon follow. Ohio Bell announced last week it will offer et switching to its business custo ers. Ohio Bell is the first Ameritech company and the third former Bell telephor unit to offer the service, which will be available in the Ohio service areas of Cleveland, Columbus, Dayton, Toledo and

Southern New England Telephone Co. and New Jersey Telephone Co. are already

ering the service Packet switching enables users to re-place several dedicated private lines with one packet-switched transmission path. one packet-switched transmission path. Instead of paying a fixed monthly charge for dedicated lines, customers pay for a cket-switched line according to use Federal and local regulations barring et-switching arena will soon be lifted, said Joaquin Gonzales, an analyst with Stamford, Conn., research company the Gartner Group. Inc. "Within 18 months, you will have packet switching operated by phone companies in every Local Access and Transport Area [LATA]."

ulators and packet-switching ser-endors like GTE Telenet Communica-Regulators and tions Corp. have expressed fears that the regional phone companies might maintain artificially low prices for packet awitching by using telephone revenues to subsidize the services. The divested Bell companies should keep their data transmission and telephone operations separate, or we're at a disadvantage," GTE Telenet President J. David Hann said during a recent interview

[CW, March 24] According to Gonzales, different state regulatory agencies are making independent decisions on the assue The Public Utilities Commission of Ohio has already approved the tariff for Ohio Bell's packet

NEW THIS ■ Pictel offers a

videophone voice/data sysother new products, see op. 73-83.

INSTANT ANALYSIS

'We have no acquisition plans for any computer company."

— Janua AT&T president sking at las

SNADS, MCI gateways extend reach of IBM's electronic mail

By Elisabeth Horwitt

KING OF PRUSSIA, Pa. — Addressing

the needs of IBM users that want to communicate with other systems in other loca-, Soft-Switch, Inc. recently an-ced Mailbridge Server/MCl and the SNADS Gateway family of products.
The Mailbridge Server/MCI, IBM mainframe software priced at \$10,000, pro-vides transparent connectivity to the MCI Communications Corp.'s MCI Mail electronic mail service. It works in conjunction with Soft-Switch's other Mailbridge servers supporting Digital Equipment Corp. All-in-One and Decmail, Wang Laboratories, Inc. Mailway and IBM Professional Office System (Profs) and Distributed Office Support System (Disoss) document distribution systems. All servers except

Mailbridge Server/MCI users can send documents to MCI Mail subscribers and also use MCI's links to Compusery, Inc.'s Compusery Mail and to 1.6 million telex users. Incoming MCI Mail messages are automatically stored in the user's local Last week MCl annour ed that it would

market its own version of the Soft-Switch product, MCl Link, a \$10,000 software nackage that links users of the Profs el tronic mail system with MCl Mail. "The virtue of our system is its simplicity," MCl spokesman William Stern said. "You don't need to change anything on your system. Our product is specialized, Soft-Switch's is more general

"It's a very smart move for both compa-nies," said Walter E. Ulrich, president of See GATEWAYS page 26

for Mailbridge Server/MCI cost \$15,000 XA LAUNCHES DRIVE TO ACQUIRE MAINFRAME SOFTWARE PRODUCTS

os Gatos, CA. March 29, 1986 —XA Systems nelnframes. number a new corpo-nte effort to develop

"XA's nationwide network of sales and support offices represents an exceptional opportunity for a software de-fect of the sales of the

ance of the Xperi recognized leader

PRODUCT FOR EDITING VSAM AND IMS DATA UNDER ISPE

os Gasos, CA, March 29, 1986—XA Systems, supplier of application development software for the IRM of naphratuse environment, amounted toldy major Among the extensions in a VSAM file allocate and delete facility which opperate IRE the familier non-VSAM delete stillibles. Both Data-Xpert and DMS-Xpert make it easy repolation programmers to work with their data from speciation programmers to work with their data from the contract of the contract

TSO/ISPF.
At Signetics, a user of Data-Xpert continented, "
Data-Xpert handles all the data manipulation problems
or application developers date with and it sefficient and
to use." Tom McHugh, XA Systems vice preside
marketing and sales went on to explain that XA's proput the power to edit, extract, reformat, or print all
with Siles and McS databless in the handle of application

parties should call XA Systems at 408-395-1800 al information about Data-Xport or IMS-Xport.

COMMUNICATIONS

Gateways swit

From page 25

Walter Ulrich Consulting of Houston. "MCI has stated that it would like to be a carrier's carrier, connecting with everybody's electronic mail system," Ulrich said. "Linking up with Compusery was a move in that direction. Now, MCI can tap into Soft-

Switching

Service Out

From page 25

switching service, which is called the Ameritech Packet Switched Network.

At this point, Ohio Bell's packet-switching service is intra-LATA.

Gonzales said that most of the income the regional phone companies will derive.

Within 18 onths, you will have packet

switching operated by phone comnanies in every

LATA

from the packet-switching

service will come from con

necting customers to the

main packet-switching pro-

viders in much the same way

that local telephone compa-

nies derive much of their in-

to long-distance telephone

Users may link up with the Ohio network through

dial-up circuits at up to 1,200

bit/sec. or through dedicated circuits at rates of up to 56K bit/sec. Ohio Bell has installed Northern Telecom.

Inc. SL-10 pucket-switching

nodes and remote equipment in Cleveland, Columbus, Dayton, Toledo and Akron.

service providers

- Joaquin Gonzale Gartner Group, Inc

Switch's broad base of IBM installations," he added.
"And the link with MCI enables Soft-Switch, aiready a leader in document translation, to move further into document distribution," Ul-

rich said.
According to Soft-Switch's
Chairman and Chief Executive Officer Michael Zisman,
SNADS Gateway represents
the first time a third party
has implemented IBM's System Network Architecture

Services

(SNADS) on any machine.

He added that the SNADS

Gateway is a "more robust
product" than Soft-Switch's
Disoes server. "I wouldn't be
surprised if it improved
throughput by an order of
machine."

Permits document exchange

The SNADS Gateway works with Soft-Switch's other communications products to enable non-IBM users

to exchange do

IBM systems on Disoss.

"And they don't have to use the IBM Document Interchange Architecture interface, which many people dislike," Zisman said. "Wang users still see Wang Office, DEC users see All-in-One and so on."
"Soft-Switch is offering a

valuable service by linking up a wide range of document generation and distribution systems," Ufrich said.
"In a recent study we did, 40% of respondents recognized a need for revisable-

to form document interchange r- between incompatible sysr- tems.

eris"We probed deeper and
found that over 90% really
ce, needed it — it was just that
some companies hadn't identified the need," Ulrich add-

s ed.
SNADS Gateway costs
\$35,000.
Both the Mailbridge Server/MCI and the SNADS Gateway run on IBM System/370
mainframes or compatibles
supporting MVS or MVS/XA.

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designed specifically for a virtual memory timesharing environment with multiple terminals. Along with our database management system. United in the state of the state of the state of the 4MB of memory —so there's minimal need for VAX memory and CPU. Further, the database and operat ing systems are partially implemented in microcooling.

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convenience into the hands of both programmers

and non-technical end users.

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Ultimate's fourth-generation language also aids the programmer by cutting application development time from weeks to days. Already included are word processing and business graphics. And because the Ultimate VAX is based on PICK, more than 2500 proven business applications are readily available. To protect your software investment, programs you create or purchase are transportable to other DEC® hardware, including the VAX 750 PRO, 786, 786 door.

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O 1005 To 1 book On

Packet-switch perspective

From page 25

The solution would be to make the packets smaller, but this increases overhead due to framing and addressing characters needed in each packet. As wideband facilities become more available, this overhead becomes an acceptable trade-off.

Packet-switching transmission speeds are also limit ed by switch and line capacities. Even the larger packet-switching systems have a throughput of only it to 10K packet/sec. And outgoing trunks can only car ry up to 56K bit/sec. Development efforts are under

way to raise the throughput to 1M to 2M packet/sec. Another packet switching issue that bears watching is the evolution of standards. In the past, different ven-

dors have implemented inconsistent variations of X.25, the COTFT-developed asynchronous packetswitching standard. Recently, U.S. companies have agreed on a version of 3270 Display System Protocol, a standard for IBM 3270 bisynchronous access to packet-switching networks, but

standard for IBM 3270 bisynchronous access to packet-switching networks, but
there is no equivalent standard for IBM Systems Network Architecture devices.
Until recently, users of
packet-switching services

have suffered from the fact that packet-switching protocols guaranteed deliyery and data integrity between packet assembler/disassembler nodes but not between a node and the "last mile" to the terminals. Communications protocols such as the

tions protocols such as the CCITT X.32, the Microcom, Inc. Microcom Networking Protocol and Tymnet/McDonnell Douglas Network System Co.'s X.PC offer a partial solution to this prob-

From a cost-justification standpoint, the desirability of using a packet-witching service depends on the application. For example, suppose a business needs to send 100 separate transactions of 1,000scharacters each, such

1,004-haracters each, such as point-of-able credit card authorizations. The total dial-up cost, even using state-of-the-art 10K bit/sec dial-up moderns, would be \$50 because of phone companies' one-minute minimum charge per call. In contrast, total costs using Tymnet's 9.6K bit/sec, packet-awitching service would come to

on the other hand, suppose someone needed to transmit one 300K bit/sec. file (one floopy) across the country, Using a 10K bit/sec

77

A packet is like a bus that waits to be full before it departs; clearly a taxicab would be faster because it can leave with only one or two

passengers.

modem over a direct-distance dial line, the transaction would require 240 seconds, costing approximately \$2. Tymnet, in contrast, would charge \$3 per hour for access, plus 4 cents per thousand characters. Total cost:

sand out access. Act to the Second of the Control of the Control

practice witt cease is it can tomers begin to complain. Technical improvements in packet switching and trunking interfaces, along with emerging standards such as the Integrated Services Dégital Network and International Standards Organization's Open Systems Interconnect, should make the packet switching option much more attractive in the next few years.

Coming Soon Brass Balls & Hot Peppers





DOS TO MVS CA-CONVERTOR THE COMPLETE SYSTEM FOR TRUE CONVERSION AUTOMATICALLY

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SOFTWARE & SERVICES

share SNAX with LU6.2

By Jeffry Seeler
CUPERTINO, Calif. — Tandem Computers, Inc. last week joined the trend to interconnect with IBM's LUS.2 protocols by announcing an extension to its Systems Network Architecture Communications Services (SNAX), which allows Tandem's Nonstop products to communicate with

Services (SNAL), which allows Tunden's SNAL onguithe requirement, any principal of the service o

Now, however, "Tandem's systems can have PCs below them on a network and IBM mainframes above them, and they can

IBM mainframes above them, and they can all talk to each other through the same protocols," Mathews said. He claimed the function will make it easier for users to de-velop applications "because the user only has to deal with one set of programming make intered of covered."

has to deal with one set of programming rules instead of several."

In the SNA world, the only major exceptions to Mathew's performance claims are systems running under IMS, which IBM has yet to enhance to support LUG2. Tradem users who want to communicate over SNA with IMS-based systems will have to

Tandem will | Uncle Sam's upkeep woes



Maintenance problems continue; suggestions meet apathy, resistance

By Mitch Betts WASHINGTON, D.C. — Just as it is in the private sector, software mai

the private sector, software maintenance and the sector of the but there are some faint signs that this sit-uation is changing, according to software experts at the National Bureau of Stan-dards (NBS) and the U.S. General Services Administration (GSA). NBS, (or example, published a popular NBS, (or example, published a popular to the Neders of the Sector of the Sector of the NBS of the National Bureau to the Neders of the Sector of the National Sector to the Neders of the National Sector of the International Sector Sector of the International

we neep managers snare souttons to their maintenance problems. GSA, meanwhite, has been promoting its software mainte-nance and conversion services, including a "programmer's workbench" of software acceleration for

productivity tools. productivity tools.

Government interest in software maintenance — particularly from the DP management troiks of GSA, the NBS Institute for Computer Sciences and Technology (ICST) and the president's Office of Management See LINCLE page 31

INSIDE A division of Ster

ling Software introduces an interface to Cullinet's IDMS/R/30

INSTANT ANALYSIS

'1116,2 is the strategic direction for integrating distrib uted transaction processing sys-

tems.

IBM enhances data facility line

By Rosemary Hamilton RYE BROOK, N.Y. — IBM recently an

RYE BROOK, N.Y.—IBM recently amounted enhancements for our of its storage are not its distance of the storage are not its data facility family running under the MYS/K operating system.

The programs were tirst introduced manages are not its data facility family running and the storage of th

by license fee of \$1,025. The second program, the Data Parity The Parity The Second Parity The Second

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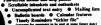
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SOFTWARE & SERVICES

Dylakor's IDMS/R interface out

By Eddy Goldberg GRANADA HILLS, Calif. - The Dylakor Division of Sterling Software recently introduced DYL-IDMS/R, an interface module that con-nects its DYL-280 and DYL-280 II information and file management system for IBM mainframes to Cullinet Software, Inc.'s IDMS/R relational data base management

The full-function interface allows DTL-280 and DTL-280 Il users to retrieve and up-date conventional records logical Record Facility re-cords and IDMS/R table en-tries from IDMS data bases. It also provides access to IDMS' integrated data dictio-

naries.
The interface product uses both DYL-280 commands and the same commands used in Cultinet's Cobol Data Manipulation Language. Dylakor Pressdent Carole Morton said that users familiar with IDMS Cobol commands will have no trouble using DYL

The MVS version of DYL-IDMS/R is available for \$8,690 to customers who own DYL-280 or DYL-280 II. A VSE version is expected ter this year. Dylakor also a

that new releases of DYL-280 (5.1) and DYL-280 II (2.1) contain a feature called Vfile. This feature allows users of DYL-Vlink, the company's micro-to-mainframe connection, to extract mainframe information and transfer it to virtual disk files that can be accessed by a network of per-

nal computer users. DYL-Vlink, a trans line to mainframe-resident virtual disks, allows personal virtual disks, allows personal computer users to access and control public or personal virtual disk files with common IBM PC-DOS and Microsoft. Corp. MS-DOS commonds. A nite license for five micro users costs 86,200. Mortion said that Vfile can be used by information centre coordinators to provide

ter coordinators to provide PC users with access to sensi tive corporate data without fear of compromising data integrity or security. Only the data in the virtual file is ac-cessible to authorized users.

Other enhancements to DYL-280 and DYL 280-II include an expanded compiler for compiling larger pro-grams, a new Quit command that enables programmers immediately to terminate programs and a feature that ows Pile statements to be put anywhere in a program.

DYL-280 Release 5.1 is
priced at \$11,000 and DYL-280 II Release 2.1 at \$15,000 for OS and DOS versions.

Tandem goes to LU6.2

From page 29 protocol — Secondary Logi-cal Unit Type P, Mathews

In addition to supporting LU6.2. SNAX/APC provides a high-level interface and other tools that "make the product very easy for pro-grammers to use and shield them from having to know a lot about SNA." Mathews added. "Programmers don't have to worry about the chalning and packaging of data because those kinds of functions are done by the product automatically."

Por Tandem's Nonstop EXT processors, SNAX/APC is available for a \$1,000 cm a value of a sail to the control of the

time license fee and a \$240-per-month maintenance charge. For the Nonstop II charge. For the Nonstop II and TXP systems, the price includes a \$6,000 initial lise fee and \$600 in month-

ceue fee and \$600 in month-ly maintenance expenses. As part of the latest SNAX/HLS release, Tandem has added support for a pro-prietary protocol, Federal Link Access for Secondary Half Sessions, which permits financial institutions to com-municate with the Federal Reserve's network.

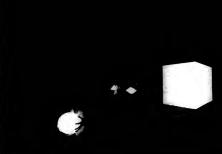
serve's network. In the past, banks that needed to exchange informa-tion with the Federal Reserve system had to write their own communications

code and maintain it them seives. But with the en-hanced version of SNAX/ HLS, Tandem will take over

MARCH 31, 1986

the maintenan The revised release of SNAX/HLS also includes an

SNAX/HLS also includes an enhancement that "increases the degree to which applica-tions can control data flow in a network," Mathews said. The latest release of SNAX/HLS costs \$5,000 for a one-time license fee and in-cludes a \$600-per-month maintenance charge.



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Plus you'll have full use of the SQL and QUEL database languages. All of which means people who need information get it easily. In the shape that's

Uncle Sam's upkeep woes

From page 29 agement and Budget (OMB)
— has been growing for the
last three or four years, according to Roger J. Martin,
manager of the software engineering group at ICST.
Martin says the interest
was triggered by a 1980 report by the General Account-

ing Office titled, "Pederal Agencies' Maintenance of Computer Programs: Expen-sive and Undermanaged." we and Undermanaged.

More recently, an NBS sur-ey found a familiar litany of roblems at federal agencies, acluding management. tention to maintenance, the relative lack of maintenance methodologies and tools (compared with those avail-

e for software develop-nt) and the difficulties of

Six years after the congressional report, software maintenance still suffers from neglect, according to Richard G. Harrison, director of GRA's Federal Software Management Support Center. "I Just can't get over the amount of emphasis that is placed on new development,"

"There are a few organiza tions that are taking the maintenance problem seri-

ously, and by that I mean taking action that follows a maintenance plan. The rest are just seriously thinking about It. We've got pockets of excellence and pockets of re-sistance," Harrison says. Some companies argue that automated maintenance

lectual efforts on the job of problem solving 22-member staff, provides software maintenance and conversion services to feder-il ágencies on a cost-reim-bursable basis, but it can bursable basis, but it can reach only a small part of the vast government DP commu-nity, Harrison says. The cen-ter currently has a \$25 mil-lion contract with the U.S. lion contract with the U.S. Navy to convert five million lines of code handling four separate homegrown data bases from Sperry Corp. Uni-vac 404s and BCA Corp. com-puters to IBM processors run-ning Cullinet Software, he IDMS data base software, he

ns cetting fo

SAVS.

Referring to the ancient Univac and RCA processors, Harrison observes, "If government kept up with the changes in hardware and software over the last few years, most of these conver-sion costs would not exist. ut to keep up, you need the soney, which usually goes to new operations, not main-taining what's already

Wilma M. Osborne, ICST's project manager for software aintenance, says the key to improving the climate software maintenance is to get high-level, nontechnical managers to understand and support it. "Unless there is management involvement, top-down pressure, software

top-nown pressure, software maintenance is unlikely to happen," she asserts. Osborne says she is pleased that the Federal Soft-ware Maintenance Group meetings have attracted doz-ens of federal executives and that a new pocket guide on software maintenance has been popular, too. The maintenance group is also devel-oping a slide show.

High-level need to see that the existing inventory of software is valuable, and there are soft-ware tools to make it more maintainable, understandble and useful." she says.

IBM boosts data facility

From page 29

this function through the ISMF. It costs \$215 per

month. The Data Facility Sort Release 8, designed for fixed-length record sorting, has been enhanced to include variable-length record sort-ing, a function also invoked through the ISMF. It has a monthly fee of \$247.

The new versions will be available in the third quarter, with the exception of the Data Facility Sort Release 8.

which is available now

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MICROCOMPUTERS



Lotus: Building bridges too far?

rom no revenue in early 1982 to \$225 million in 1985, Lotus De-velopment Corp. has become the largest independent software vendor, overtaking a plateaued Cullinet Soft-ware. Inc.

ware Inc. However, more than 90% of Lotus revenue comes from its micro produc-tivity tools, mostly its spreadsheet-

pased products.

What will happen to Lotus when
most people who need a spreadsheet
have one? How likely is this kind of
saturation? Should people who aren't
Lotus employees and stockholders par-

The problem for Lotus is that soft-ware, for all intents and purposes, is immortal. Unlike the case with hard-ware, one is never absolutely forced to

throw things away and start over Moreover, once an application is working, a software conversion is a no-win exercise: In the year 2065 we will,

oubt, be celebrating the centenary of IBM 1401 emulation Coming out with new quantum leaspreadsheet products could be a dan-gerous solution for Lotus: New products would render old products obso-

lete, making current customers testy, to say the least. More important, the radsheet market would be reopened for Lotus' tiny competitors.

Lotus has been quite intelligent in
the development of new versions such
as 1-2-3 Release 2 and add-ons such as

1-2-3 Report Writer. But some users have already had difficulty in adapting to even the relatively minimal changes from old to new 1-2-3 releases. Future releases will run into further resistance to change.

So whether you look at new products or enhancements, there is not an auto-See LOTUS page 34

O'Flaherty is a principal of Informa tion Service Strategies, a Wood-Ridge, N.J.-based consulting firm.

Alpha to unwrap package

Tool uses same file format as Ashton-Tate Dbase III

By Douglas Barney
BURLINGTON, Mass. — Alpha Software Corp. is scheduled to release a new

mid-range microcomputer data base, Al-pha Data Base Manager III, in May, according to software experts who have viewed

he product.

The package's key strength is that it uses the same file format as industry-lead-ing Dbase III from Ashton-Tate, allowing it to read directly Dbase files and use Dbase to read directly Dbase files and use Dbase data disks with no conversion required, said Jeffrey Tarter, publisher of "Soft-Let-ter," a newsletter for the microcomputer software industry. "I don't know of any-thing else that does that," Tarter said.

I think they can do very well with this it is exactly what people want, " said per sonal computer consultant Adam Green "It works natively with Dosse files."

Alpha officials declined to comment on Other programs, such as Microrim, Inc.'s R:Base 5000 and Ansa Software Corp.'s Paradox, require Dbase files to be nverted before they can be used, making it difficult to sell these programs into cor-porations that have standardized on

Dhase. Conversion is time consuming and can unnecessarily create two different versions of the data base. In addition to compatibility with the

Dbase data file structure, Alpha Data Man-ager III is compatible with Dbase NDX in-dex files and supports Dbase functions for doing trims, substrings and sophisticated manipulation of strings. The report writer is menu driven and allows users to build detailed technical reports without pro-

The product also has conditional logic milar to Dbase that is largely geared to enerating form letters. For example, an ecounts receivable department could create custom form letters with different apoaches based on geographical location, e amount owed or the degree of lateness

"It looks like companies that already have Dbase as their standard will use this because it is a lot easier to use." Tarter said. "If you have got a company that is standardized on Dbase, the only people

who can write applications are Dbase pro-Data Base Manager III is entirely menu driven but is not menu bound, allowing adept users to use English commands. For example, instead of using menus to design a report and print it, users will be able to type in "R" for report, "D" for design and

With this thing, any idiot can write a very powerful application. You can get ac-cess to all of the Dbase commands, but they have cleaned up the interface. It real-ly is beautiful to use," Tarter said.

Green predicted that it will take a day

EW THIS WFFK

True Basic offers Hercules graphics card support pack-

For more on this and other new products, see pp. 73-83.

INSTANT ANALYSIS

'If I were looking in a crystal ball. I'd say management of information as a resource will start to be shared between data base admin

istrators and information center people. There nay be turf battles, but it's new stuff that's coming down. — David P

Managers form info center group

By Eric Bender
NEW YORK — The Big Apple has finally joined the ranks of cities with an infor-

The newly formed Information Centers

Annagers Association of New York aims to bring together managers to discuss issues and experiences. An initial meeting, held at AT&T beadquarters earlier this mo

drew about 50 managers Since the information renter concer was born about nine years ago, "We've fluctuated back and forth from order to chaos countless times and confronted new sues with surprisingly regular irregular-y," noted cofounders Donna Dufner of lansfacturers Hanover Trust Co. and Da-id Phillips of Metro-North Commuter Railroad in a written statement

"We are looking, like everybody else, for some kind of peer association. Philips commented. Although an annual gathering of information center managers is held, he and Dufner saw a role for a local

oup that met more often.

According to Phillips, related gro such as the Microcomputer Managers As-sociation were more interested in addressing administrative and technical ques ons, such as when to upgrade a package

than in information center managerial problems, such as how to write an end er support contract. The association intends to hold bi-monthly meetings. Those interested in more information should contact the Pro-ductivity Center, a New York consulting

and training firm

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Lotus bridges from the same soil - they built too far?

From page 33

matic productivity tool re-placement market like those If anything, there is an antireplacement" market, if you take into account the ef-

ets of illegal conving and site licensing. So Lotus may well have future problems with its mainstream business.

Should we care? Yes, even jealous competitors have more of a stake in Lotus' suc

cess than they might imag If Lotus is not a prosperour survivor then the entire software industry will suffer. Potential customers and

investors will perceive software as a muci vestment than hitherto as-Lotus is vulnerable bese it has little in the way

curring revenue. IBM, on the other hand, receives a continuing stream of income from software rentals and operating system enhance-

Some independent main-frame software vendors get 20% to 25% of their total income from recurring ser-

Certainly, expanding the 1-2-3 family makes a lot of sense, and Lotus has several users with a disp tion to buy. However these efforts just raise the yield

Alpha micro

data base due

or two for a novice to learn.

From page 33

don't open up new territory. Lotus, of course, is aware of these potential dangers. In the last year it has undertak-

en a series of product en hancement and diversification efforts Besides its productivity tools Lotus is moving into three other families of prod-

to-host software, Opencial data services and Other offerings are prom

> 77 The problem for Lotus is that soj ware, for all in-tents and pur-poses, is

ised for the next year, including engineering/science and artificial intelligence-

A year ago, Lotus agreed with Cullinet to develop and market jointly micro-main-frame links tied to Cullinet's

mainframe products.

Recently, Lotus acquired its own link product, Bink, and terminated its relation-ship with Cullinet. This was a brave step, given the slow

sales of micro-mainframe links generally and Lotus with the main frame world. Can the micro tail wag the mainframe dog? Signal is another new Lo tus product born via acquisi tion. Signal transmits cur rent stock quotes to special

The package is expected to cost about \$300, and it may

Torres Florida 33607

duced by Alpha three years ago that has an installed base be bundled with Keyworks, a keyboard utility that allows rs to create custom menus of some 40,000 units. The new product is currently in and to generate macros.

Data Base Manager III is a total rewrite of Data Base

personal computer hardware

and software. Lotus has also made arrangements to sell satellite dishes to those too far from the cities broadcast ing Signal's signal. In addition, Lotus bought

lsys Corp., a company that supplies historical financial ta, which can complement gnal's short-term data. But Signal sales have so en relatively weak ents and Will the enhance

increased market familiarity with this innovative produc produce another 1-2-3? Prob

ably not Letus Magazine has swum ccessfully against the ebb ing tide of computer publica s. But it is not clear that the magazine will be much more than a well-conceived marketing and support tool that pays its own way

New products out of step The interesting, and som what worrisome, point is how each product family is out of step in at least one spect with Lotus' main stream tools and with each

· Hink is almed at main frame computers and will be used by and sold to MIS professionals on a department basis rather than by PC us

 Signal involves hard ware as well as selling information as a service. It will also generally speaking be Publishing involves an

orientation quite unlike the nancial data services. Manager II, the Integrator, a

driven data base intro-

test with some corpo-

mers The package runs on IBM Personal Computers and compatibles with 256K bytes m-access m (RAM). The product is not RAM-based, and a hard disk is recommende In related news, Alpha has announced a new version of the \$89.95 Keyworks keyard enhancement program. Keyworks 2 contains a cut-and-paste feature that allows the user to copy data

It is hard to find many other examples of compan — even IBM — that have found the secret of selling

disparate products into a a diverse collection of mar-The attempts of indeper dent mainframe software companies to sell micro soft-

ware are not very happy nitation and diger

Lotus appears to see the mediate future as a time similation and diges tion. How else to explain its cision to spend at least a ird of its cash hoard on buying back its own stock? However, Lotus certainly

has enough on its various plates to keep it busy for a while. It is a fair question, though, to ask whether all of otus' new restaurants have three stars. Perhaps we can summa

rize Lotus' position by analo-gy: Data processing is some-times viewed as a series of information archipelagoes that will gradually be linked Lotus appears to be trying to colonize many of these is-

But are they green and pleasant lands or rocky and infertile? And given the current state of information engi-neering, can bridges be built

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not have to prepare in ad-vance to create a macro. Other new features include menu editing and the ability to set all printer na rameters without leaving the nlication

from the screen and transfer to other applications, files or even a printer The program also reportcontains keystroke recall a function that retains the user's last 300 key-strokes to create "after-themacros, so a user does

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Product Spotlight

Edited by Barbara Wierzbicki



INSIDE

Managing a fourthgeneration language and DBMS: Address applications development problems early/40

Consider flexibility and compatibility factors when selecting a fourth-generation language/42

Networking capabilities and downward applications migration signal positive growth for minicomputer **DBMS**/46

Comprehensive minicomputer/mainframe DBMS chart/49-58

Mini and mainframe DBMS The seven-step solution

By SHAKU ATRE

A data base management system, including data dictionary and fourth-generation language, typi-cally costs about \$333,000 for a one-time license This figure, however, represents only the tip of the financial iceberg.

The major cost lies not in the system p The major cost lies not in the system purchase price but in the cost of time — time that systems analysts, application programmers and systems programmers spend analysing various applications to be developed, creating the applications and then maintaining both the applications and the DBMS.

tions and the DBMS.
In its first year of operation in a Fortune 400 company, a DBMS requires the attention of approximately 12 programmers, one systems analyst and a data base administrator. Salaries and fringe benefits for these personnel total 11 million. For cost reasons alone, then, the evaluation and selec-

Atre is president of Atre International Consul-tants, Inc. of Rye, N.Y., which specializes in infor-mation center implementation and data base/

tion of a minicomputer- or mainframe-based DBMS

tion of a minicomputer- or mainframe-based DisSN:
But there is another reason. But there is another reason with the second of related to the second of critical importance is the immediate and congoung involvement of the immediate and congoung involvement of the second of the second

rectly affect the communications link required for accessing the production data on the mainframe from micro-

data on the maintrane comgeometry, the evaluation prosolution of the common temperature of t

Companies could avoid needless problems and expenditures by executing a well-planned DBMS strategy within a threemonth time frame.

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tem and a new architecture that we call Precision Architecture.

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PACKARD

Some DP executives think they can change vendors

and/or systems if a DBMS implementation does not work the first time - not true. Conversion is

like changing the tires on a running car.

Seven steps to a DBMS solution

Continued from page 35 establishment of an information cen ter makes little sense. Even if not acquired at the same time, all products should be evaluated simult

Some DP executives think they can change vendors and/or system if a DBMS implementation does not work the first time — not true. Conversion is like changing the tires on a unning car. Converting software from one system to another is ex tremely time-consuming and, as a result, very expensive.

er takes place. The existing application systems continue to operate as oped systems use the new DBMS. Two DP experts, devoting them selves on a full-time basis, should complete the entire evaluation and rtion process, as well as the immonths. If it takes longer, the evalu-ating committee members may lose interest and opt for ill-fated short-

User meeting.

cuts, such as installing any DBMS just to be done with the project. To select a DBMS, follow this seven-step approach:
• Identification process

a Elimination process Preparation of request for pro-• Response evaluation.

· Final evaluation at the vendor's

fines those applications and func-tions to be implemented first on the DBMS. Representatives from user management must be included as evaluating committee members be cause they are the ones who decide which business functions will be ini

tially automated. Acquiring manager ment for the succeeding evaluation selection and implementation phase resents a major activity in the identification process. Top-level management will expect to see some quick results in the first six months Be certain the initial application tar geted for implementation on the DBMS is not so overwhelmingly large that the project cannot be comple within the six-month time frame

he elimination process dis-qualifies all DBMS that do not have the following characteristi · Compatibility with both your hardware and operating system. Up ward compatibility needs to be co sidered, too. While the operating sys-tem used today is IBM's DOS/VSE, tomorrow it might be MVS or VM.
Make certain the selected DBMS sup ports the upward-compatible oper

ing system.

• Compatibility with your telepro-cessing monitor (IBM's CICS and IMS/DC), the programming language used in your organization (Cobol, RPG-II, Fortran, PL/I); and existing prepackaged application software such as payroll, accounts receivable and accounts payable

 An easy-to-use integrated data dictionary and user-friendly utilities including report writer, ad hoc query capability and prototyping facility, such as those found in Information Builders, Inc.'s Focus or Martin Mari-etta Data Systems' Ramis II. At the conclusion of the el

tion process, the number of contendare ideally should not exceed six The preparation of a request for roposal serves as a blueprint suitable for acquisition of any software exceeding a purchase cost of \$50,000 exceeding a purenase cost of 300,000 or a monthly leasing fee of \$1,500. The request for proposal must first provide a detailed profile of your company's computing environment in order to establish vendor evalua-

tion and selection criteria.
To that end, the request must de fine the minimal set of requirements to be met by those six vendors wishing to present products for consider ation. Base these requirements on your company's current hardware and software environment, as well as specific needs determined by management to be important, such as the availability of a report writer, query package interface and application

rogrammer productivity tools The following sample of ent, based on Company X's comput ing requirements, outlines the pre requisites vendors must satisfy if they want their products considered

· Hardware. The DBMS should be capable of running on an IBM 4381 with I6M bytes of memory. In addi tion, the DBMS must support local-area net working, IBM's Systems Ne work Architecture and clusterin

Operating system. The DBM

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A CONTROL POR EVEL MATTING DERING WEN Organization's Computing Requirements Weight Vendor Score Weighted Score 77/2 2. Operating System Support - Compatibility with current operating system - Compatibility with future operating system 2. Toronteel Support - Interface to making interpressing marker - Supert of making interpressing options on - Assess markets markets Desta Dictionary Insurface to existing deta dictionary Insurface to existing detail dictionary Dictionary active and letting state with rest of product line Recot Language Interface Compatibility with existing programming language Query and/or Report Writer As her reporting capability Spontaneous queries created by both technical and end usual containeds Degree of dependence on DP technicians Application Software (prepackaged and pure Compatibility with general ledger, payroll, accounts modifications involved. Server Hender Support Technoid expertise Technoid expertise Technoid expertise Technoid expertise Namen of support staff resided Namen of support staff resided Technoid expertise Data tess structure (degree of flesbility) 14. Data integrity and System Security ace to existing security software 20. Fourth-Secondice Lenguage, Prototyping and Applications Programmer Productivity Tools - Increase in programmer productivity - Prototyping tools - Ease of maintenance 22. Vondor Profile - Financial stability Beforences - Saluded Conteners - Separate in member of conteness in the past year - Number of COHC worn 24. Upons Group Involvement - Active users group is a positive indication of stable product live

Continued from page 38
must currently run under/IBM'a
MVS/SP and be upwardly compatible
with MVS/XA and future releases
from IBM. It should also be executable under VM/CMS as well as MVS VM/CMS

 Response time requirements.
The DBMS must support 6,000 transactions per hour from 60 on line concurrent users with response time av eraging two seconds for 95% of the time and up to a maximum of four seconds for the remaining 5% of the

 Host language interface. The DBMS must be capable of supporting Cobol and Fortran interfaces compatible with standard language pro-

ort wreter The DRMS should directly interface with a report writ

er facility that allows users to easily select, retrieve and print data in an on-line mode. Output should optionally be directed to either a printer or

• Query language. This sh an on-line, interactive query facility that interfaces directly with the

MS for ad hoc retrieval of infor-

DBMS for ad hoc retrieval of infor-mation by nonprogrammers.

• Data dictionary. The DBMS should incitude an Integrated data dictionary/directory system.

• Bestart and recovery. The DBMS must have a comprehensive and reli-ble recovery system that uses either valid or incomplete transactions and data base images are backed up; and/ or the shadowing approach with invanialing for transaction recording) arnaling (or transaction recording) ery by reapplying transac

tions against a previous version of the data base. These facilities should

or specific files, records or logical

* Teleprocessing monitor. The
 DBMS should include an interface to
 IBM's teleprocessing monitor, CICS.
 * File support. The DBMS must
 support SAM, VSAM and external
 sequential files from Honeywell,
 Letter CICS & *Letter CICS & ***

review written by Marilyn Z. Smith, "Winners Circle.
I found it hard to distilke Professional COBOL. It is clearly
the best of the compilers evaluated. It also takes into

count the wear and tear most COBOL programmers

For Fourth Ceneration language buffs our Sourcewinter product can help you quickly build finished systems. Sourcewiner in a data-dictionary based interactive application generator which lets you create single- and multi-user applications in the time it would normally talke you to specify COBOL And because ig perior of Professional COBOL to add the same richness and complexity as hand-coded solutions.

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in this and in a series of reviews finalized in the August issue of PC Tech Journal.

sequential files from Honeywell, Inc.'s GCOS & operating system. The second portion of the request for proposal defines the technical specifications of those DBMS candi-dates being considered. This infor-mation abould be gleened during the written questionnaire. Make certain that the mailed survey poses its que-tres in the same sequence as those ries in the same sequence as those

|Managing a 4GL project

By GEORGE SARTY

our organization has acquired a state-of-the-art data base management system, and one or more fourth-ceneration language manage...
You have been appointed project
manager of the first large application development effort using this
much-heralded
evelopment efforts using this

As an experi enced project manager, you have probabl dealt with a vari ety of technol ogies, so why

ment project using fourth-generation nguage/DBMS technology present any special problems?
To begin with, fundam atal dif.

ferences exist between developing systems in a third-generation environment such as Cobol/VSAM and ronment such as Cobol/VSAM and developing systems in the fourth-generation language/DBMS environ-ment. As project manager, the suc-cess of the project and, ultimately, the long-term success of fourth-gen-eration language/DBMS technology within your organization, hinges or

eration language/DBMS technology within your organization, hinges on your understanding of managing development using this technology.

A fourth-generation language/
DBMS package is generally sold to an organization on the strength of productivity, shorten development cycles (and therefore reduce applic tions backlogs) and control the cor-

tions backlogs) and control the cor-porate "data explosion" with its at-tendant storage costs, by sharing data across applications. Understandably, given the sub-stantial investment such a package represents, corporate and MIS man-agement expect to realize a signifi-

One of your first challenges as One of your first challenges as project manager, then, will be managing the performance expectations fostered, in all likelihood, by the DBMS vendor. It must be made clear to corporate executives that the acquisition of fourth-generation language/DBMS technology allone does not provide an immediate reserved. The company of the provide and the provi

Only solid, long-term planning in Only solid, long-term planning in data administration and aystems de-velopment, plus a willingness to adopt new methods, enable as norga-nization to realize the full benefit potential of a fourth-generation lan-guage/DBMS environment. To facili-tate this process, it is worthwhile to join the users group for your DBMS to learn from the experiences of oth-er organizations before setting out to p your own data base system.

Most organizations have estab-hed a formal systems development Sarty is a consultant with Maxi-ma Computer Management Consul-tants Ltd., an Ottawa-based consul-ing firm specializing in fourth



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Product Spotlight DBMS evolutionary prototyping

methodology to assist in managing and controlling the development process. Very often, however, the existing methodology has been devel oped for use with Cobol/ VSAM or other third-genera tion environments and may not be workable for a fourt generation language/DBMS setup. A thorough review of your organization's methodology should therefore be un

rtaken prior to starting the project.
When using fourth-generation language technology, it is particularly important that data base design activi

ties be addressed throughout the development life cycle. In addition, because data bases must be able to be shared as well as expanded, design cannot be performed from a purely application-oriented perspective but must also include the corpo

rate view

Systems generally can be classified as either operational or decision support types. Operational systems. such as payroll or acc receivable, are based on methodologies that incorpovative approach.
Typically, this approach

ds that system develnent activities be sequen tial: All user requ must be specified before commencing with system de sign; system design must be eted before coding can begin and so on. Decision support systems usually make up the bulk of an orga-

nization's application back log. They do not lend them es to a sequential development methodologs are difficult to prespecify

Also, unlike operational stems in which data is usu ally organized to be accesse by a specific application, de cision support systems often have data requirements that cross application and organi zational boundaries.

The need to meet these rents is largely the motivation for acquiring a DBMS, so chances are that most of your system develop ment will be of the decision

support type.

How then do you address the problems associated with developing decision support systems? The key lies in the systems? The key lies in the flexibility of a fourth-gener-ation language, which allows the use of new techniques typing and Iterative systems

Evolutionary prototyping techniques of system develment are particularly use ful when requirements are primarily user-driven and/or

Based on high-level re quirements, an initial proto-type is developed, consisting of screen scenarios but no detail processing or editing The user can then specify changes or additional requirements that are used in

the next stage of prototype This prototyping techque utilizes the technology as a means of communicating ith users and allows them to become actively involved in the process of defining ning their require

ments. Another advantage of

techniques is that the initial ototype can be used to develop an application data view at an early stage in the

As a final note, it should embered that increased programmer produc-- a benefit ofte tioned by fourth-generation nguage vendors — does ot translate directly into re duced development cycles. Given that coding normally represents only 30% of the total development time and that extra time is required unlikely that the develop ment will be significantly

faster for a fourth-genera-tion language/DBMS project Most of the issues discussed here are typically en-countered by organizations when they first attempt to develop a large-scale appli-cation using fourth-generation language/DBMS technology. Unfortunately, these ems often result in the belief that fourth-generati languages cannot deliver their benefits on a meaning

By identifying and addressing development prob-lems at an early stage, however, fourth-generation language/DBMS technology can play a significant role in helping your organization ieve its data proce and corporate goals.



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Continued from page 40 outlined in the profile of your com-pany's computing environment. Oth-erwise, you will spend weeks fishing for answers in vendor promotional materials and technical manuals Comparing the capabilities of dif-

ferent products is far more manageable when vendor material is consistently presented in a standard format. Another time-saving step is to specify one contact point from your organization and ask for a sin-gle vendor contact.

Evaluating vendor resp the next step. Your company's insuse criteria and the mailed ques re comprise a DBMS checklist to be used in this phase (see vendor scorecard page 39). Two people should participate in the rating protem is obviously subjective. This occasion is also the appropriate time to invite contending vendors to provide technical presentations of their DBMS offerings. Upon completion of this step, four vendors, at most, should still be under consider

The user meeting involves int viewing references given by the four vendors. Be certain that the users' operations resemble that of you own environment. If your operating system is DOS/VSE, then the reference should not be running MVS/XA with 2,000 terminals attached. Also, make it clear to each vendor's sales representative that you wish to in rview the references privately. This way, assured of being able to

support, users will not feel intimidat-

ed about answering questions can-

Try to visit two user sites for each of the four vendors, ideally on the same day. You should not, however, visit user sites from different vendors on the same day - unless you want to feel like you have been to ovies and cannot remember what happened in which plot. As a further note of caution, be sure to compile a written report for each vendor's product on the day of your

Four people from your organiza tion, including the sponsor manager should conduct the vendor reference interviews In addition to ob queries regarding system perforance and vendor support, question to be posed to DBMS users should

Choosing a flexible 4GL

By RONALD DUBIEN

he pressures of increased apations backlogs and user ds for greater access to info ation prompt many DP managers to examine the advantages that fourth generation languages claim over Co bol. Of principal interest are the promises of increased productivity and ease of use, and it is on the basis of these features that fourth-genera tion language products are most of ten evaluated. Unfortunately, these features alone do not guarantee the successful implementation of a

fourth-generation language The most critical — and most of ten overlooked — factors to consid when evaluating a fourth-generation language are its flexibility and com-patibility with the organization's hardware and software environ

The flexibility of a fourth-generation language can be measured by its ability to support detailed fine-tuning of an application in both development and maintenance phases. In addition, the language many many many file dition, the language must readily allow the user to incorporate arbi trarily sophisticated functionality, particularly given current trends to ward on-line, interactive systems de-There are two important reas

why a fourth-generation language must be truly flexible if it is going to be effective. The first relates to the changing nature of application back logs. The second is that it must be able to reduce the errors introduced during the requirements definition phase and actual design of a system Traditionally, the greater part of an organization's data processing re-

sources has been spent in the devel-opment and maintenance of operaanal systems such as payroll and accounts receivable. Developme methodologies for such systems, in which users must prespecify (once and for all) their requirements on the isis of outmoded manual procedures, are still predominant in many

DP departme But today's backlog consists of more than purely operational sys-tems. It includes complex decision support and planning and manage ment information applications, nor

cification Nonoperational systems, although defined by users in advance, are most effectively developed when the user has an opportunity to "test drive" a prototype before final ap

proval is given The inevitable changes requ during this process, while painful to implement in a Cobol environment paratively simple if using a flexible fourth-generation language. In addition to facilitating the

Dubien is president of R. J. Du bien and Associates, Inc., a data base management system consulting firm based in Ottawa. He is a former consultant with Maxima Computer Management Consultants Ltd. in Ot-

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ent of no tional systems, a flexible rth-generation languag can be valuable in reducing the errors in defining user ments that have tra-

ditionally plagued the sys-tems development process. Communication errors between weers and analysts documentation errors, changing technology and program interdependency all make it difficult to retrofit

applications to accommodate new or expanded functions When evaluating a fourthgeneration language for flex-ibility, look for the following

• The degree of isolation between the language and the data structure · Cross-referencing of

data usage in applications.

• The extent of automation (computer assistance) in making both large and small changes

ery often a newly acquired fourth-generation language, having been successfully implemented in vides disappointing results when it is put to work on more ambitious tasks. Indeed some organizations find that the language adds to their applications backlog rather than to system fund tionality, but it is more likely that the fault lies with an incompatible hardware/software environment. In most organizations,

where data processing is al-

Books, events offer more information

ed in learning more about data base management systems may find the follow

publications and seminar **Publications**

helpful.

The Dynamics of Data Base. W. H. Inmon and Thomas J. Bird Jr. Prentic Hall, Inc., Englewood Cliffs,

Hall, Inc., Englewood CHIIS, N.J. 1985.

Database Technology
and Management. Robert C.
Goldstein, John Wiley &
Sons, Inc., New York. 1985.
Database Management.
Esen Dukarahan. PrenticeHall Inc. Englewood CHIES. Hall, Inc., Englewood Cliffs,

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ready supporting a complex hardware/software environ ment, there exists little room for a sophisticated new soft ware product that co integrated easily. All too often such products, perceived to be of limited use by the DP department, are subsequently relegated to such mur

ne, isolated tasks as file Ongoing maintenance co cerns dictate that existing applications, even if they

meet user require ust be converted because they are in maintenance-only mode. Consequently, the ap-plications backlog grows. In order to be truly useful

a fourth-generation languag must be able to process user data. And since the bulk of this data (such as inventory of sales records) resides within the existing environ ment, the fourth-generation language must be compatible with that environment.

Finally, when establishing riteria for evaluating a fourth-generation language tion of any relevant industry trends. In data base management system technology, for example, there appears to be

growing vendor momentum behind multilevel architec ture, driven by an active data dictionary.
Since a fourth-generation
language would integrate with the data dictionary as

an external facility, thus type of architecture would allow for multiple fourthgeneration languages in ornizations where one product is inadequate to meet every user need. Chances are, then, that

the product line of most DRMS vendors will include a DBMS, a data dictionary as well as a fourth-generation language tool with all three running in both central and distributed modes.



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Product Spotlight/DBMS

Mini DBMS mart growing

By JOHN GALLANT

ot only have mincomputer data base management systems become technologically sophisticated — and profitable — products in their own right, but they also are increasingly viewed as the intermediary website for linking desktop systems and mainframes.

The performance of minicomputer

systems continues to improve with minicomputer vendors aggressively targeting their hardware beyond tra-

ditional niches to the commercial data processing market. Thus, minis are becoming hosts to a variety of formerly mainframe-based applications — the types of applications that cry out for DBMS support. In many ways, the future of the minicomputer DBMS market is closely tied to the trend toward networking of diverse processors and the

ly tied to the trend toward networking of diverse processors and the
migration of applications downward
from the mainframe environment.
"There has been an awakened interest on the part of min vendors
who are realizing they don't have to
bequeath to 19th the entire commercial marketplace," says Ann Morley,
editor of "Software Watch," a news-

letter from the Framingham, Massbased market research firm International Data Corp. (IDC). "While IBM recently has been taking on Digital Equipment Corp. in the scientific/engineering market, a relatively small area, DEC is going after the entire business market," Morley

says.
"DEC is saying. 'Run your decision support, office and even transaction applications on a VAX, and you can expect pretty good basig do the buck.' We'll see more and more decentralization of applications, the buck we'll see more and more leave of meaning data bases, and that is why we are seeing so much interest in mini DBMS," the says.

In terms of market penetration, Morley says, the mini DBMS market can be likened to its mainframe counterpart of 10 years ago. While IDC estimates that roughly 90% of IBM's high-end mainframent on at least ord DBMS, perhaps just 30% of all DEC

VAXs can boast a DBMS. For less widely installed minis, DBMS usage may be only 20%. But what the mini market lacks in

may be only 20%. But what the mini market lacks in installed base, it more than makes up for in growth potential. Estimates of future growth in minicomputer DBMS sales range from a conservative 30m ger appearance of the sales of the sales

Different segments of the mini

Estimates of future growth in minicomputer DBMS sales range from a conservative 30% per year up to 40% annually through the rest of this decade.

DBMS market will experience different growth, explains Gary Morgenth between the president of Alameda, Calif-based Relational Technology, Inc. Relational Technology markets Ingres, one of the leading independent misincomputer DBMS products. "Overall, 30% to 40% growth is realistic," he says. "But I see even

minicomputer DBMS products.
"Overall, 30% to 46% growth is realistic," he says. "But I see even higher growth rates for certain sectors of the Unix-based mini market and lower growth for software aimed at mini vendors with proprietary operating systems."

packe Corp. President Lawreace Elison thinks the term main DBMS market may no longer be quite accurate. "The mini market traditionally was made up of government agencies, small divisions in large corporations, engineering departments and universities. In general, large corporations die not of desa

processing on anything but mainframes. Ellision says.

But the trend in large organizations is to network mainframes to minist to personal computers," he says. "From now on, the whole DBMS market has to be viewed differently. What users are looking for is the same soft ware running on min is, mainframes and micros." (Oracle's relational DBMS runs in those

cle's relational DBMS runs in those three processor environments.) Relational Technologies' Morgerthaler adds, "What is clear is that IBM's DB2 in a strategic product and one that will be successful. What falls out of that is that there will be considerable interest among mainframe customers in relational mind DBMS products that are SQL-based

and offer applications portability into the main frame DB2 environment."

Having a DBMS that operates across processor boundaries allows.

So GALLANT page 48

Gallant, former Computerworld senior editor of software and services, is now managing editor of Networld World a sister multication

National Database & 4th Generation Language Symposium

MEMORANDUM TO Mr Lynch PROM Bon Q RG Exallent 11 appared m Digital Consulting Associates, Inc. ign me up too! National I have spent many hours researching our 401 Andware squission, it will take 6 months for my department to make its recommendation will take 6 months for my department to make its recommendation of the financial Fastisment of t Database & 4th Generation Language Benefits we'll get from attending the flymposium are: symposium Mone (60 in all) outh to betwork and seem them other and net them genter great members of DCVI sustaining action arion, principle on exhi-CACHO HEEK ding up with to will be giving a lecture! troughy recommend that a corporate decision making team of Ren. ry and Kristin go to the Sympostum as well as myself by the way

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toring and tuning of the data base to you have separate test and production data bases: · How many transacti

formed on first shift, and what is the mix (update, query and so on) . What is the maximum load of transactions you get through you

ask load? . How many terminals are being utilized, and of those, approximately how many are concurrent users? Are there any remote sites tied to the

 How do you handle your data base backup and recovery · How often must you reorganize

your data bases? After meeting with users, you should eliminate all but two vendors I recommend not having a clear-cut winner at this point since if only one vendor is a finalist, you lose leverage

in contract negotiations Visiting the headquarters of the to represents the next step in the DBMS evaluation and selection

GALLANT from page 44 for some measure of application tability, analysts say. But the DBMS role in the expanding scope of minicomputer use must be wider, Morgenthaler says.

Having a product in different hardware environments affords ap plications portability." he says. "E there is also the issue of intercon-

necting those environments to share Relational Technology currently offers the In-gres/Net product

that allows Unix-

VMS.based minis running Ingres to

centhaler says

be upgraded to link into IBM's

ture within the

Traditional m vendors such as Relational Technol

next year. Ingr also runs on IBM

der VM/CMS

Ingres/Net

work Architec-

sed and DEC

77 True relational DBMS, pushing for mainstream acceptance in the mainframe world, is the rule rather than the exception in the mini environment.

omputer DBMS

ogy and Oracle are not the only ones

Mainframe stalwarts Software AG of

North America, Inc. and Cincom Sys-

One group of observers contends

search, Inc. will also take aim at the

burgeoning mini market. But others

say their products are poorly suited

ainframe giants like Cullinet Software, Inc. and Applied Data R

tems, Inc. also tout the current mul tienvironment capabilities of their DBMS offerings, IDC's Morley says

veraging the networking trend

You should already know the vendors' market positions and financial situations. But visiting the company headquarters provides an opportuni ty to find out about its research and development effort.

If an organization does not spend adequate amounts of resources (at least 8% of revenue) on R&D, the product line most probably will soon be obsolete. Other important issues to address include the amount of the budget set aside for technical support and the type of infrastructure established for the support organiza-

top-level management involves justi-fying the conclusions reached reding a specific DBMS selection In your executive summary, you must justify not only the reasons for

ending a particular vendor but also the reasons for eliminating those vendors not selected. Many companies experience needless problems — and expend

when trying to select a DBMS. In most cases, using a well-planned strategy, executed by DBMS evaluation team experts within a three-month time frame, will yield positive, productive results frame world, a DBMS is clearly a tool

with which DP management can con-trol the shop. Mini products are used

by smaller groups with less formal

requirements and less need for con-The products are simpler, and that is both a strength and a weakness Those looking at it from a mainframe perspective would say that mini DBMS will grow more and more complicated as they take on a higger role. I am not sure that is going to be the case the min DBMS realm is than the main

frame arena. True relational DRMS muching for mainstream acceptance in the mainframe world, is the rule rather than the exception in the ment.

The first thing minicomputer us ers needed was ease of use and pro ductivity. That is why relational got a foothold in the mini world long before it did in the mainframe world." Oracle's Ellison says.

But despite the promise of future growth, minicomputer DBMS ven-dors still have a long way to go to match the financial success of their mainframe brethren.

There's plenty of market opp tunity. But there is still some reticence on the part of customers be cause they are not convinced yet that they need to make that invest ment in DBMS," Morley says.

'Mini buyers are much more price sensitive than mainframe buyers They are used to having software bundled either by their OEM or hard-ware vendor. The concept of paying for packaged software is really a mainframe notion. Technology is pushing these users to look at DBMS but users are saying. This isn't the way we bought software before."





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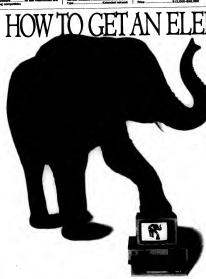
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Cobol restructuring engines clean up spaghetti code



People put U.S. companies into the software maintenance mess, and people will clean it up. Cobol restructuring engines, which can reduce maintenance costs by as much as 50%, may be the catalysts.

By GIRISH PARIKH

rogram restructuring is just beginning to enter the vast and relatively unexplored world of software maintenance. The re-structuring engine is likely to become one of the most practical tools for DP personnel because of its ongoing use-

fulness in program maintenance. Ever since researcher Guy de Balbine developed a restructuring engine in the early '70s to restructure Fortran programs, the concept of automated software restructuring has excited managers who must deal with old, problematic unstructured software However, in spite of the popularity of structured programming in the '70s and early '80s, automated restructur-

ing did not catch on With the advent of Cobol restructurers, especially IBM's recent entry into the marketplace, the idea of automated restructuring seems to be surfacing. In the world of Cobol restructuring, Peat, Marwick, Mitchell & Co.'s Structured Retrofit offered the first nercial service and, in time, the

first restructuring tool. Later entrants in the Cobol restructuring race include Group Operations, Inc.'s Superstructure, developed by Bill Morgan; Language Techni Inc.'s Recoder, developed by Eric Bush; and IBM's Cobol/SF developed by Rick Linger and his team In this discussion, these four prod ucts and services are presented chro

pologically based on the dates of their introduction into the marketplace.

At the heart of the Structured Retro-fit process is the Cobol structuring engine designed by J. Cris Miller, de-veloper of the first commercial Cobol restructuring engine and a pioneer of tool-based maintenance concepts.

The structuring engine turns un structured Cobol code into structured, functionally identical code. The restructuring process removes all AL

Parikh is a Chicago-based consul-tant specializing in software mainte-nance and productivity. His books in clude There is a Fortune to be Made in Software Maintenance (Shetal Enter-prises, Chicago, 1985) and Handbook of Software Maintenance & Sons, New York, 1986).

ents. PERFORM-THRU and FALL-THRU logic; eliminates dead code; restricts GOTOs to local loops; repackages the program into a hierar-chical structure; and isolates and consolidates all 1/0

Structured Retrofit uses an automated assembly line process, consisting of the following steps:

Score. A static analysis and management reporting tool called Pathvu highlights unexecutable code, use of ALTERs and GOTOs, levels of logical nesting and software structure and so

The old program is analyzed by Pathyu, which determines if manual intervention is required. For example if there is a runaway path, it should be

fixed before restructuring Compile. Retrofit takes a working but unstructured Cobol program and produces a functionally equivalent

structured Cobol program.

Review, If the first steps have highlighted compile errors, significant should be reviewed and fixed immedi-

Format. Using the formatting software tools, the readability of the code

is improved. Recompile. The new structured pro-gram is then recompiled to ensure that

it is clean of diagnostics.

Optimize. Using object code analyz-

ers, the hardware runtime performance of the new code is improved Validate. After completing the retrofit process, the restructured program is validated to ensure that identical inputs produce the same outputs as the old program did.

Using a Cobol program as an input program, Superstructure produces a new, functionally equivalent output rogram that is organized into a series of modules executed from a mainline routine by a hierarchy of PERFORM

Superstructure retains the original flow of the program with which the mers are familiar while reormizing it into a structured program. he tool offers a number of options: It can reorganize the performed odules in executional sequence for those who prefer to work with such

• It can change or retain paragraph and data names and reformat the

In Depth/Cobol Restructuring Engines tecture

program for better readability and ederstanding.
Superfluous prefixes and suffix-

es from paragraph names can be stripped off. In the process of restructuring

sperstructure does the following Eliminates interparagraph GO-TOs. GOTOs that loop within a para-

graph remain. Eliminates fall-throughs. Converts dead code to comments Corrects PERFORM range viola-

une Al TER statements and altered GOTOs.

puts: a listing of the input (unstructured) program and a structured program output file. Also produced in the beginning of the structured source listing is the

Outputs list the restructured pro-

"Superstructure scorecard," giving the management summary of key statistics related to the structuring

This scorecard profiles selected

structure criteria and lists, for the old unstructured program and new restructured program, the count of features such as interparagraph GO-TOs, fall-throughs, performed proce ments and lines of dead code. This data gives an indication of the improvements in the restructured pro

Superstructure Release 5 provides an option to reorganize modules in top-down executional sequence. It supports both command-level and macro-level CICS statements in the same program. In addition, the new version provides expanded comment

documentation for main line archi-

coder reads and analyzes any IBM Cobol program and writes a ally equivalent struc tured program. The restructured pro-

gram is characterized by top-down logical flow, with a main routine that gives the big picture and a hierarchy of subroutines that contain more and more detail

The program also uses single-en-try/single-exit blocks of code, which the program addresses in turn, never skipping wildly backward and for-ward using GOTOs or conditional GOTOs in IF statements, as in the old

In Recoder, the program structure is not a feature of source state Instead, it is achieved by reducing

the program statements to mathematical form using normalized graphs of the program algorithm. This technique, called the directed flow graph approach, is used to mo el many complex processes in mod-ern technology — critical paths, ner works and traffic flow, to name a

w examples. Briefly, here's how Recoder First, the unstructured program is translated into a mathematical form

called an abstract syntax tree. This re is conceptually similar to agraming a sentence ree-to-tree transformations are then performed to redote the types of control flow expression to a few simple types. When the tree is simple

igh, it is transformed into a di rected graph, a network-like str ture that represents the control flow of the original program.

Successive passes of the tool over the graph recognize patterns in the network structure and reduce them to less complex patterns. This gradual simplification process ends when the overall topology of the graph represents a perfectly structured al-

The structured graph is trans formed into a new syntax tree repre-senting a structured program. Several additional transformations are w performed to improve the read ability of the final code When the final syntax tree is

reached a Cobol code generator cri ates a new program that conforms to the abstract syntax. Because each transformation along the way preserves functionality, the new gram is provably equivalent to the such as level of nesting, type of oper-ators, complexity of expressions, formatting style, representation of pro-

Programs restructured by Recoder not use GOTOs, ALTERS, SEC-TIONs, PERFORM-THRUs and fall

In addition to the restructured program, Recoder creates a structure chart of the new program. The structure chart documents the new program's modularity and reveals its op-down structure. The chart helps in understanding the program and serves as a useful tool for training and maintenance

Cobol/SF transforms the spaghetti logic of an unstructured Cobol program into a structured Cobol pre gram with top-down hierarchical code. The restructured programs are single-entry/single-exit programs that contain no GOTOs or ALTER program statements.

Cobol/SF is one of the first software maintenance products to use artificial intelligence. According to the yendor, it makes use of Al techniques that involve the use of production, or IF-THEN, rules. The pro duction rules are drawn from the definition of the Cobol programmi language and from structured pro

ng principles Each production rule by itself can nly recognize a particular pattern in the input Cobol program. Any part of the Cobol program matching the rec ognition pattern is then transformed into a new pattern. When many such rules are collected and allowed to act on the Cobol program in combina-tion, the resulting process can

produce a structured program



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resembling one created by a pro-

grammer.

According to the vendor, the product is useful for reducing software maintenance, facilitating program reengineering and enforcing structured programming standards during new development projects. Cobol/SF can restructure any Cobol program of the company of the cobol of the company of the cobol of the cobo

time interface code, such as CICS.

The first three steps of the following six-step restructuring process involve program analysis of the existing unstructured program. The last three produce a structured, well-do-

cumented version of the program.

Preparation of an unstructured
program. If the existing program is
not already in VS Cobol II syntax, it
must be converted. Also verify that
Cobol/SF symax is satisfied.

Cobol/SF syntax is satisfied.

Analysis mode. Cobol/SF analyzes the existing program and generates a reengineering report that describes the transformation it can make to the existing program. It also identifies any problem area in the input program for analysis and re-

Optimization of an unstructured program. You can redesign or reorganize any logical knots in the code to help make the final program more usable. This can result in improvements in the structured output.

Generation mode. The process

the received in analysis mode is repeated, this time using the improved input program. Then, a structured output program is produced, guided by selected controls on structuring and for matting. Documentation of structured pro-

gram.

Verification of a structured pro-

User experiences

Sharon Girulat, director of the development support center at Combined Insurance Co. in Chicago, selected Structures Retroffit after comparing its output with those of comparing its output with those of comparing its output with those of the comparing its output with those of the comparing its output with those of the comparing its own content of the comparing the

The old, flat, file-oriented programs will be converted to operate is a Cullinet Software, Inc. IDMS environment. Separation of inputs and outputs will enhance programmer productivity in this conversion.

Because of the initial elevation of the initial sessiting up the present groups, clirals says she expects a curve, clirals says she expects a form on the first few programs restructured, in the long run, with more programs restructured, she expects adds that 2% to 3% of the programs will need assumal intervention in restructuring, this may very coramin to the conditions of the programs in

different environments.

Liberty Mutual Insurance Co. In
Boston finds Superstructure, Installed there since 1984, useful in

stalled there since 1984, useful in restructuring spaghetti code that imposed maintenance problems. According to Paul Mooney, the company's systems manager, the department identified 50 real spaghetti programs, some 20 years old, that ran well in production but turned

into a nightmare when modifications were required. In addition, moving the company's DP operations to Portsmouth, N.H., in 1980 resulted in

Portsmouth, N.H., in 1980 resulted in a loss in programmer continuity. While the DP department was about to start rewriting some of the programs, it heard about 50 perservers. After testing the programs, it heard about 50 perservers, the department installed it and, in a few months, had restructured the 50 programs. As a result, the DP department installed it must be programs. As a result, the DP department has found more free time for

ment has found more tree time for development.

According to Mooney, the applications' logic was essuer to follow in restructured programs. Liberty Mutual will eventually rewrite many of the programs but only in response to functional needs, not because of

maintenance problems.
In a trial run, Len Foster, senior

s staff analyst at Tampa, Pla.-based GTE Data Services, Inc. restructured two Cobol programs, totaling 2,000 lines, using Recoder and Superstructure. Programmers worked for seval months on programs restructured

al months on programs restructured by both companies and found programs restructured by Recoder easier to work with than those restructured by Superstructure.— As a result, GTE Data Services licensed Recoder. Foster expects that

As a result, GTE Data Services licensed Recoder. Foster expects that the automatically restructured programs with Recoder will help reduce software maintenance costs. GTE Data Services plans to restructure one million lines of Cobol code this

Reaping benefits of restructuring Restructured programs reduce software maintenance costs and in prove maintenance programming productivity. Some users of structured technologies report that structured software reduces software maintenance costs up to 50%. Presumably, such software was desired using a structured technique.

But can the restructuring of the old, poorly structured and inadequately documented software yield the same benefits when automatical ly restructured? Can the benefits realized by one user of a restructuring product or service be achieved by other users as well? Will a product fit into a particular organization's environment and culture?

Here is a way to select a product or service that is right for a specific environment: Restructure one complex, medium to large Cobol program with all four products. Let four programmers — all with about the same experience and competence and with

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In Depth/Cobol Restructuring Engines

A restructuring engine, however capable and intelligent, will not replace human insight and perception. The engine will aid in understanding engine with aut in understanding software, which is generally a prerequisite for modifying software correctly. But the effectiveness of this aid will generally depend on the condition of the old software.

the necessary training in un-derstanding restructured programs - work on them performing the same mai nance assignments for a few days. A fifth programmer can continue to do the same assignments on the old, unstructured program.

This process will resemble a contest, and each program-mer will try to excel. Ground and the results should be carefully recorded and evalnated to help measure the

Shouldn't You Be One of Them?

ntity as well as the quality of a programmer's (or a programming team's) work The above test should be gram whenever possit nprove the accuracy of the selection process. It is easy to see that selecting the right

ct can make a substa tial difference in ongoing savings in software mai nance costs. The above project will cost a small fortune. So why

stakes are enorm wide investment in Cobol totals \$100 billion, according to estimates by International Data Corp., a Framingham Mass,-based market research

Most of these programs are unstructured and undoc-umented, and IBM estimates that maintenance program-mers spend one-half of their time understanding pro

The time programmers take to understand the pro gram, or its parts, in order to do an assignment can also be included as a criterion in oductivity measurement for the project.

The first generation of Co-

bol restructuring engines was based primarily on the function-structured programming techniques developed by scientists such as Corrado Bohm, Giuseppe Jacopini, Edsger Dijkstra and Harlan Mills.

However, data-structured programming techniques, such as logical construction of programs/logical construction of systems pioneer neered by the French sysems scientist Jean Dominique Warnier, car prove to be more powerful in software maintenance as

well as in development that the functional technique The "logical retrofit en-gine," based on Warnier's concepts, can help standardize software maintenance work nationally, saving U.S. mpanies billions of dollars Artificial intelligence will be used more often in soft ware maintenance with ad

vances in the Al-based restructuring technologies, including possible future "intelligent restructurers." Other potential areas of research and development include automated restructur ing of programs in other languages and migration to higher level languages and to ern software or hard

ware technologies. Of course, training to make the most of the tool is essential. Also, structured programming standards and lines based on the selected product should be de-

A restructuring engine however capable and intelli-gent, will not replace human

insight and perception. The engine will be an aid in understanding software, which is generally a prerequisite. for modifying software cor-rectly. But the effectiveness of this aid will generally depend on the condition of the old software.

It was people, in spite of their best intentions, who got us into the maintenance mess; and it will be people, aided by powerful tools, techniques and training, who structuring engines may well be the catalyst.

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Users fine-tune 4GL strategies

MIS goes on the defensive when vendors and experts call Cobol a poor performance choice. But corporate users find 4GLs perform better only in certain environments, and some major corporations choose 4GLs for only 5% of the staff.

By JAMES JOHNSON

MIS vice-president: We have been researching fourth-generation languages and may soon implement the selected product for all development. I would like you to review our logic and comment on the proposed strategy.

Consultant: What have you learned from the research?

MIS vice-president: Well, first, improving productivity during the development cycle is a high priority. A pilot project indicated a 3:1 productivity gain over Cobol, our standard procedural language. Also, maintenance is now almost 60% of the system development resource; a fourth-generation language should reduce the percent significantly.

Consultant: Anything else?

MIS vice-president: Yes, fourth-generation language capabilities have matured. In addition to ad hoc reporting, they now support graphics, simulation and data base update. Also, we feel CPU consumption can be controlled via tuning.

Consultant: Do your end users write their own reports?

MIS vice-president: Yes, most do, and we support this trend.

Consultant: Do end users develop small, less-than-one-you for. They are organizate you for. They are organizate.

man-year systems on their own with a fourth-generation language? MIS vice-president: Yes, in

Consultant: Are your corporate applications highly integrated and tailored? MIS vice-president: Yes, very much so. You should see our system integration chart showing all the data and file inter-

Consultant: How about productivity aids for your standard procedural language are they extensively devel-

oped?

MIS vice-president: We have a state-of-the-art operation utilizing on-line edit, compile and debug. Structured code has been used for years, and code is copied whenever possible.

But your questions don't re-

Johnson is director of systems development at Hallmark Cards, Inc. in Kansas City, Mo. He is the author of Managing Productivity in DP (QED Information Sciences, Inc., Wellesley, Mass. 1980). late to the assignment I hired you for. They are organizational issues. Let's talk about whether or not we should use a fourth-generation language for all future applications based on technical factors such as language capability, CPU requirements and productivity.

Consultant: Let me explain my logic. . .

This dialogue illustrates factors normally not related to an MIS division's fourth-generation language correction language strategy. Are to constitute the constitution of the constitut

Hallmark Cards, Inc. maintains a conservative strategy toward fourth-generation languages, limiting their use to small percentage of its MIS staff. The company initiated a project to define the factors influencing this strategy, Clarifying these factors, Hallmark clieb its rule of limited use with other strategies employing a more liberal deployment of

In Depth/4GL Strategies

il. strategy decision matrix ng is good use (IFPS). Selected accounts of personal ex periences were suppler rited by an informal survey of MIS managers with a variety of responsi-bilities. The survey obtained data

ns in this decision matrix consider technical, MIS and co The ques is to use a fourth-generation language. Depend-ommendations for devising strategies are given

HOW TO SPOT THE LEADER

fourth-generation languages, such as the strategy used by a division of

While PPG's strategy of rewriting all of its systems in Cincom Systems. Inc.'s Mantis resulted in a 35% im provement in overall MIS productivi-

ty Hallmark sought to answer of question: Is this strategy practical for us and other corporations A decision matrix - a tool for developing or refining a fourth-gen

eration language strategy - can aid the analysis of various strategic factors, such as programmer and man tenance productivity and CPU and language capabilities. This matrix al ws diverse strategies for different corporations and concludes that organizational issues, not technical oney dominate the strategy selec-

Hallmark's own experience is based on five years of Martin Mariet ta Data Systems' UFO development limited work with Information Build ers, Inc.'s Focus, extensive end-user support of report writing with Infor-matics General Corp.'s Mark IV and Execucom Systems Corp.'s Interactive Financial Planning System

comments on guages used, percent of MIS staff using fourth-generation languages, CPU cor s, strategies for employing fourth-generation languages and maintenance re-quirements. The fo-

cus centered on technology issues. since those were judged to be of primary importance at the time The companies selected possess varying degrees of fourth-generation

language experience Fifteer nies returned the completed form including American Cyanamid Co. Bell Canada; Bethlehem Steel Corp.; Burlington Industries, Inc.; Coca-Cola Co.; Duke Power Co.; Johnson & Johnson; Monsanto Co.; and Raiston Puring Co. The survey base is com posed of relatively large companies ore than half reported system development staffs of more than 100

After reflecting on the survey's diversity, a pattern emerged that re-lated the strategies used with the technical and organizational environment of each company. This view was verified during a ser inar pre sentation of the survey results. Mor than 50 companies participated in

the group discussions; representa tive comments are presented here Variaty of strategles

Fourth-generation language strat-egies define who, when and how the languages are used in a corporation. In the course of the project, there merged a collection of strategic rules such as the following

• Use packages first, fourth-generation languages second and no third-generation languages.

 Wait for fifth-generation lan-guages while investing in third-generation productivity aids.

Separate all report-writing functions organizationally, and employ a fourth-generation language

for this purpose

• Use a third-generation language for complex reports and batch pro-cessing and a fourth-generation lan-

guage for simple and medium reation languages on a system-by-system basis, using processing charac

teristics as the criteria. As expected, the survey confirms that a variety of strategies exist ations: Seven organizaamong corpo tions reported less than 20% of the staff using fourth-generation lan guages, while four organizations not-ed more than 60% of the staff using a fourth-generation language. Why the disparity occurs - a more difficult question — was not answered direct-

ly by the survey.

As an example of the selection process, consider some survey responses to the question, "What is the basis for determining if an application should be written in a fo

eneration language "In our installation, all new applications are fourth-generation or higher level languages unless pur

'The MIS staff has a list of

77

To argue CPU

performance or delivery time without

considering the

complexity o

misleading.

strengths and weaknesses for the fourth-generation language tools. The MIS staff also con sults with the devel opment center to make appropriate language selections.
"Judgment based

on apparent size and complexity of applistrictly to simple apobestions Obviously

corporations, a spectrum of fourth generation language strategies exists - from developing all applications in a fourth-generation language to ited or no use of those lang Who is right? What are the relevant factors? Users trying to determine the correct fourth-generation strategy to use should consider the follow-

Productivity Issue:

ing criteria.

In development time a prio Fourth-generation language develop-ment productivity is dictated by the ount of procedure code requ Fourth-generation languages dra-matically reduce development time for simple applications, but this advantage decreases as more proced code is required. Thus, to argue CPU

performance or delivery time without considering the complexity of development is misleading

In maintenance consuming an in-creasing percent of the staff? Main-tenance productivity follows a similar nattern as that of determining development time

In James Martin's book Applica-tion Development Without Program-mers (The Telecom Library, New York, 1982), a 58-line Cobol program calculating the mean of a set of numbers is replaced by one line of I ne of Nomad

(DIGITS) - an impressive de stration of the power of fourth-generation language nonprocedural code. However, another side to the productivity issue exists that is sub stantiated by Hallmark's experi-

ences, its survey and other sources. Basically, fourth-generation





Fifteen years ago, the typical business activates could past should be able to the state of the

startup setting forth with a disk and a prayer.

Of those unspeces handred, very few laws such the test of time. A now who has, we can tell you that shoesting badges and single-periage technology may have gotten us started but they sent's what made us goos into the McCommerk & Dojes of today is Aghedi company offering a broad, integrated constellation of products.

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Breaking Away.

Novell broke out of the local area networking (LAN) pack nearly four years ago with the introduction of the file server. We called it a LAN milestone. Others scoffed. There years later, when IBM announced that its LAN systems would be file server-based, the rest of the pack finally headed for that first milestone.

But Novell was already milestones ahead. By porting the NetWare® LAN Operating System to 30 major LAN hardware configurations and offering over 3,000 NetWare-compatible multiuser applications, Novell had established a de facto LAN standard. A standard now utilized by more than 20,000 NetWare users worldwide.

With the introduction of System Fault Tolerant (SFT) NetWare, Novell passed another LAN milestone: affordable fault tolerance for nearly all LAN systems. And the rest of the pack is only beginning to talk about reaching that milestone down the road.

Moving Ahead.

Today, Novell isn't resting. On pass achievements or anything else. While their companies are struggling to reach Novell's LAN milestones, Novell is forging an even bigger lead in LAN technology, systems and service. A lead so big that many major LAN competitors are now buying Novell technology isst to stay in the race.

Being a leader is hard work. But Novell is in front to stay. Because nothing compares to the view from the front. Especially when you look forward to the milestones ahead.



language productivity, either in development or support, is dependent on the amount and clarity of the procedure code — code necessary when the automatic parameters are

not sufficient.

The key fourth-generation language variable — complexity — is
the ratio of procedure code to total
code required for the program or
system. For simpler systems, fourth
generation language productivity
considerably exceeds Coboi: many
documented projects support a pro-

ductivity ratio of 5:1.

As the ratio of prucedure code tutotal code, or complexity, increases, the fourn-generation language advantage diminishes; for complex applications, Cobol, because of its flexibility and structure, rates higher in

productivity
The development project produc-

7

The most important survey response emphasizes this point: Use fourth-generation languages for simple applications. Six responses to the question, "Do you feel programs written in fourth-generation language are easily supported?" affirmed, "Yes, if they are simple."

tivity chart (see opposite page) graphs productivity ranges for fourth-generation languages and Cobol, the predominant third-generation language. The Cobol lines of code are realistic for Hallmark and

code are realistic for Hallmark and generally are substantiated by comparisons with other corporations and

available literature.

The average number of lines of

code per man-day for all projects is 75. This relatively high value is obtained by using productivity aids such as on-line compile, on-line debug, copied code and subsecond response time.

sponse time.

Complexity for Cobol is a relative measure (since it is 100% procedure code) based on a combination of project innovation, technology and size.

Average productivity increases 50% on each step from complex (50 lines of code) to medium (75 lines) to simple (112 lines).

The most important survey re-

ple (112 lines). The most inducts aurvey reThe most import this point: the
fourth-generation languages for simple application. Bight companies indicate that the basis for writing an
application in a fourth-generation
to the question, "Do you feel
programs written in fourth-generation
to the question," Do you feel
programs written in fourth-generation
language are easily supported" in
front, "The
product of the
productivity with fourth-generation
language depends on complexity:

"Varying degrees of productivity can be realized, depending on the complexity of applications. ... Fourth-generation languages were not intended to be used for complex applications."

"Complex requests are very difficult to support when problems arise or enhancements are requested." "If the system is complex, the productivity gains will be less."

This is not the first time this concept has been documented An October 1884 study by Framingham, Mass-based market research firm International Data Corp., "Fourth-Generation Language: Information Needs." states that large integrated systems required expert skill for fourth-generation languages but lesser skill for

eration languages but lesser skill for Cobol.

It further states, "Fourth-generation languages and Cobol are fundamentally different, and organizations should not make the mistake of viewing these two types of program-

viewing their own yes to from a ming methods as interchangeable. A presentation by the Guide IBM users group included a similar chart showing the productivity of fourth-generation languages (IBM's DMS and ADF) decreasing with increased complexity, and complex fourth generation language applications having the season of the productivity of the Colon language applications having complexity is the significant variable determining productivity within the

Consumption an open issue

In CPU consumption a main criterion? The next technical factor,
CPU consumption, introduces controversy as illustrated by the following
survey comments:

"Ungoverned usage of fourth-generation language in both MIS and user areas has dramatic impact on CPU resources. Further, the implications of this usage for future information activities create concern regarding our ability to integrate systems effectively."

"Minor machine overheads are far overshadowed by productivity gains."

CPU consumption is an open issue specially for high-volume transactions. One study concludes that 10 end users running Focus simultaneously consume 76% of an IBM 3081 Model G's CPU capacity, an uncomfortable result for computer operations managers.

On the other hand, eight survey respondents said they do not experience excessive fourth-generation language CPU use. Only four companies noted CPU consumption as a

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problem. The paradox can be explained by one of the fol-

lowing: Performance tuning is possible in most situation nns · Simple programs inherently use small amounts of CPU resources.

• In some environ the CPU resource is not a constraint.

Assuming the survey pre sents a representative sam-ple, excessive CPU use normally does not constitute a problem unless transaction

columes are extreme reneths and weekn

Are the fourth-generation nguage capabilities com chensive — carh ian age has strengths, but any cover total MIS reente? Although all popular fourth-generation ages can be used tu hould complete systems, ca-

language possesses strengths and weaknesses. Thus, if a available, entire syste be developed. If a more limited fourth-generation lan guage is the option, exploit its strengths. The following languages

re considered typica fourth-generation languages IBM's ADF, Focus, Applied Data Research, Inc.'s Ideal; IFPS: Software AG of North America, Inc 's Natural; Mur tin Marietta Data Systems Romis II: and UFO Distinguishing fourth-generation grages as application generators, primarily for MIS professionals, or very high level languages, primarily for end users, may be aca st all fourth-generation languages are examples of both

The survey did not attompt to document specific fourth-generation language eristics such as ad hoc query, graphics, simula tion, report generation of data base update; however the languages listed general-

ly share four capabil · They allow interactive ent and testing They provide nonpri ural (what vs. how) coding They interface with var

us data bases. • They increase productivity by as much as five times that of Cobol (as measured in function points or equivalent lines of code).

HS organia

MIS organizational issues address application integration prototyping and cui rem productivity on third-

generation languages.

Are applications highly Are applications highly tegrated? Extensive into gration implies complexity and thus reduces the fourthgeneration language advan-

Limited prototyping en nment? Prototyping provides a sound reason for using a fourth-generation language; however, third generation languages may

also be used successfully ittiple productivit lemented for exis

age? For the issue of ex isting productivity aids, take the extreme example of a rel atively small organization with 30 system ment personnel using batch

Cobol, in which the line-of code productivity falls in the low range for the three complexity levels shown in the project productivity chart In this case, potential exists for significant productivity gains, and a fourth-

deneration language may provide the best approach Thus, the incremental productivity increase for a ourth-generation lang depends on current third generation language prod tivity. The PPG Industrie example mentioned earlier illustrates this situation

The training and support aspect of introducing a new language should not be mini pertuse and cross-training is a requirement. To a degre the amount of this support argues for a strategy based on organization, such as certain project groups heavily utilizing a fourth-generatio language vs. the entire staff using it occasionally.

Two organizational as

pects excluded from the decision matrix deserve mentior First, high turpover rate is not considered a factor be-cause it affects all strategies adversely - even packaged oftware is difficult to main tain without expertise. Sec ond, the negative attitudes of MIS management and programmer/analysts toward technology was not judged

valid

Although some argue that MIS personnel do not accept fourth-generation languages based on resistance t change, the results of the survey and subsequent dis cussions with a variety of corporations do not substan trate this claim. In fact, the opposite may be true engers may be too quick

to base change on inflated

Do end users write their en reports? Do end users coelop and install small stems with a fourth-gen-ration language? The ex-ent of end-user computing is tent of end a primary corporate organ zational issue. If end users e responsibility for writing reports and install

ing small systems, then MIS is responsible for generally complex "backbone/core" systems. Thus, fourth-generation languages are of re-duced benefit to MIS but of ect benefit to end users

Do end users demand tai-lored systems? If end users expect highly tailored systems from MIS, fourthgeneration languages are not recommended because proce-

dure code is required for the is obtaining of In obtaining ad CPU a problem? g additional m2 Another issue addresses the corporate philosophy toward computer

acquisitions. Does the com pany provide ample CPU caity so that utilization is not a primary concers? If so, fourth-generation languages are recommended for simple and medium complex sys

Changing view Although the majority of this discussion examines technical issues, specifically productivity and CPU con-

sumption, the questions on MIS and corporate organiza tional issues are more important when establishing a sucessful fourth-generation language strategy. In major corpor continuum of fourth-generation language strategies ex

ists, ranging from less than 5% to 100% of the program mine staff using fourth-cen stion languages. Tradition ally, technical factors cupy MIS when search ing for a fourth-generation language strategy, but it is now evident that an organ zation's environment should be the primary influence on corporate fourth-generation

Returning to the opening conversation Consultant: Now, do you see

language strategy

MIS vice-president: It is growing rapidly and needs a how my earlier questions reariety of different systems as soon as possible. End us late to your fourth-generation language strategy?
MIS vice president: Yes. ers will accept "standard systems: also, the company

nt increa

hased on my answers to the

fourth-generation language

ic functions such as proto

structure and integrated

complex applications, it is

best to stay with our third

centrate on productivity

ry subsidiary, the envil

ent is entirely different

Consultant: What are its

With our organizational

typ

mmended for specif

has adequate CPU capacity Consultant: A strategy of first purchasing packaged

tware and, when doing so is not possible, developing systems exclusively it fourth-generation language sounds reasonable for the sidiary.

generation language and con-MIS vice-president: 1 agree The right strategy varies de aids. However, at our primapending on the corporate environment Companies need to onalyze technical issues but, more important - the firm's environment - before establishing a strategy

> Consultant: The paradox of diverse but equally succe ful fourth-generation language strategies finally car



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Edward P. Dillingo Director Corporate Communications Information Charge Hill, NJ



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voice and data managers.



Ed explains just how he knows their message is being read. 'I juil logether a lied of data communications buyers and itself and successful and the successful and the successful and the successful and the successful and a substitute of a long to make the successful and the succes

In fact. Ed's own readership studies were reinforced by results of a recent Starch study. "Our InfoStream ad ranked in the top 10 percentile for read most" among all advertise-



ments studied in the issue. There's a real need for TI information in the communications field among Computerworld's readers, and our message got to these people."

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INSIDE Software & Services/74

Microcomputers/78 Communications /79

& Recoherate /83

NEW PRODUCTS

TI adds Travelmate series terminals to Silent 700 line

Texas Instruments, Inc. of Dallas has innounced the addition of the TI Silent 700 Travelmate series of portable display terminals to its Sllent 700 family.

Travelmate series includes the Travelmate, the Tra-velmate 1200 and the Travelmate DT. All three offer user interface modules that, according to the vendor, can be programmed to provide customized solutions for users' needs. The interface are plug-in applica-

vide 32K bytes of memory and 24K bytes of rar



and specific application and text editing The Silent 700 Travelmate and Travel-

mate 1200 were de-signed for portable They

come with internal 300 and 300/1,200 AT&T-com-The Traspectively. Ti tned for desktop has direct connection to the host computer

232C Interface said to support up to 9.6K The Travelmate terminal costs \$1,095; the Travelmate 1200 lists for \$1,295; and the Travelmate DT costs \$995, the vend

Videophone system bows from Pictel

Pictel Corp. of Peabody, Mass., recently introduced a videophone system incorporating its proprietary video image com-

pression technology The system is said to include Minx videophones and a network controller manufactured by Datapoint Corp. Accordr, the system can support seven terminals in a star configuration

Pictel executives claimed that their pro-prietary video coder/decoder computer ill transmit high-quality images and rice over low-cost 56K bit/sec. transmission lines, such as AT&T's Accunet Switched 56 Service.

an stated that Pictel's Motion Compensated Transform compression al gorithm measures and compensates fo changes in motion, reducing the system's need to regenerate images of moving ob

Voice is transmitted over a senarate au-

According to a spokesman, Pictel offers an advantage over earlier videoconference ing products by being software upgrad With the Pictel system, users will be able to plug in a software card to gain fu-

ture enhancements, he explain The commercial product will operate at 52K bit/sec. over full-duplex digital lines and will operate at faster speeds with im-proved quality over dedicated and TI

The product will be available by the end of the year at a cost of \$150,000 for a system including five Datapoint terminals, a local-area network connecting terminals ithin a building and the video coder/de-

The Datapoint terminals accommodate but the system is not currently capable of transmitting data, the spokesman said. He added that graphics can be compiled on a ero, and pictures of the graphics can be

DEC introduces LG family

Two line matrix printers available for text, graphics

Digital Equipment Corp. of Maynard, Mass., has introduced the LG family of printers, including the LG01 for text and the LG02 for text and graphies.

The LG01 and the LG02 are said to be 600 line/min line matrix printers. According to the vendor, the LG01 offers data

rocessing and correspondence-mode rinting as well as multiple char./in. print ons. It is said to be compatible with oth existing U.S. and European character

The LG02 text/graphics printer report-edly offers the capability to create bar

codes, custom forms and logos; sur and subscript modes, and prints in land-scape mode. In addition, the LG02 printer des all of the text capabilities of the LG01 printer, the vendor stated.

According to a spokesman, the number

According to a spokesman, the number of moving, mechanical parts of both print-ers has been reduced, providing electrical reliability. The vendor also claimed that the printers require no scheduled mainte-

Both printers are said to be compatible with DEC VAX computers from the VAX 8600 to Microvax II systems as well as with the company's Micro/PDP-11/73, Micro/PDP-11/83 and Micro/PDP-11/84 com-

ter systems. The LG01 costs \$11,950. The LG02 costs

True Basic's enhanced language supports Hercules' graphics card

True Basic, Inc. of Hanover, N.H., has released a new version of the True Basic Language System to support advanced graphics for the Her-cules Computer Technology Co.

monochrome graphics card.

True Basic's Hercules support is said to incorporate all the features of the standard True Basic language system. According to a spokesman True Basic is the first language tha allows Hercules graphics users to access 640K bytes of memory and the little Corp. 8087 processor.

Using True Basic with the Hercu-

les monochrome card, users can develop applications in 720- by 348xel resolution on the IBM True Basic's graphics syntax is said to be hardware independent, similar to the Graphical Kernel System graphics star developed using the Hercules card are directly portable to systems sup-ported by True Basic's other adapta-tions for the IBM Color Graphics

Adapter, Apple Computer, Inc. Mac-intosh and the Commodore Business Machines, Inc. Amiga. The Hercules support package is available as an optional upgrade to registered True Basic users for

The full package, including the Language System and the Hercul support, costs \$189

HP library implements GKS

Hewlett-Packard Co. of Palo Alto. Calif. has introduced a two-dimen sional graphics library that is said to be an implement rmentation of Level 2B of v-standard Graphical Ker-The HP-GKS library was designed for use with HP 9000 technical com-

puters and graphics hardware under the HP-UX operating system. It is a tool that applications devel-opers can use in drafting, process control, mapping, simulation analy-sis and presentation graphics. The applications developed may achieve performance up to 50,000 2-D vector/ puters and graphics hardware under sec. on high-performance graphics

display hardware. Peatures of HP-GKS include output primitives such as polyline, polyarker, text, cell array and fill area;

segment operations that can be used to create, copy, associate and delete segments; metafile input and output defined using the GKS metafile f mat; attribute binding that allows the attributes to be specified individually for each primitive or bundled together; tables that can be defined for general use; and input operations that are available for six classes of

HP-GKS is said to support a dy namic workstation configuration and provide device-independent access to applications that have already been written to the GKS standard are por

HP-GKS for the HP 9000 Series 200/300 costs \$1,000. HP-GKS for the HP 9000 Series 500 costs \$3,000.

SOFTWARE & SERVICES

Systems software Mitchell Associates, Inc. has reeased a new version of the Salford

University PTN77 Fortran 77 compiler, the FTN77L The version offers an 1-m generator and options for IX-mode code and global optimization. The FTN771 is supplied in executable program format and is suitable for sys-

ems running the Prime Computer, c. Primos operating system, Revi-on 19.4 and higher. First-year licenses range in price from \$5,000 to \$5,000. Subsequent yearly fees range from \$800 to \$950.
Mitchell Associates, P.O. Box 6189, San Rafael, Calif. 94903.

Wayne-Bradley, Inc. has an-ounced Operator Management Sys-em 1 for the Wang Laboratories, Inc.

The software provides m ation and maintenance with unli ed menus for an unlimited number

The menus are said to allow the setting of printer defaults for class, mode and form number for each pro-

According to the vendor, it moni-tors and logs program executions by all system users for any duration of time and provides on-line inquiry of

ng information for quick viewing of usage and hard-copy reporting

Operator Management System 1 costs \$1 995 Wayne-Bradley, Suite 250, 315 E. binson St., Orlando, Fla. 32801. Advacate Corp. has announced the PEM3000, a plant and equipment maintenance system for the Hewlett Packard Co. HP 3000. PEM3000 is said to provide in

tory, purchasing, fixed asset and ac-

counting functions.

Features reportedly include handling recurring maintenance and unscheduled work orders, providing unlimited remark lines, allowing for user-assigned standard service parts for each order, tracking labor and material costs, comparing estimates with actual costs, calculating percentage complete and hours remain-ing, providing a maintenance cost history of each asset and notifying

when planned work must be sched PEM3000 costs \$17,500. Advacate, Suite 208, 7999 Knus Road, Indianapolis, Ind. 46250. Applications packages

Management & Accounting Con-trol System has introduced its Man-agement and Accounting Control tem (MACS), originally designed

or Digital Equipment Corp. VAX computers, for the DEC Microvax. The MACS system is said to pro-vide order processing, production and financial control. Specifically, its functions are inventory control, pur-chasing, payables, receivables, order processing, sales analysis, general dger, payroll, bills of materials and

aterials requirements.

MACS offers more than 450 Cobol programs and 250 reports. It is li-censed for \$4,500.

Management & Accounting Con-trol System, Suite 400, 323 E. Wil-liam, Ann Arbor, Mich. 48104.

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-ws VS PW RT SD * LB TE GOTTE 11) Radian Corp. has added CPS/RAS to its CPS family of contour mapping CPS/RAS is said to provide Digital Equipment Corp. VAX and IBM co puter users with interactive two-diensional and three-dimensional col

or mapping of petroleum and gas reservoirs as well as gridding opera-It reportedly enables users to build complete models of oil and gas reser-

CPS/RAS prices start at \$60,000 in, P.O. Box 9948, 8501 Mo Pac Blvd., Austin, Texas 78766.

Utilities

Davis, Thomas and Associates, ac. has introduced DTA/Cobol and DTA/Recov, programs for IBN main

DTA/Cobel is said to aid IBM VSE users in software maintenance and debugging. It provides information on the source listing and rearranges the entire listing. It automatically

formats and replaces the original Co-bol listing on the DOS Power queue. DTA/Recov is a CICS/VSAM forward recovery system for use while updating VSAM files in a CICS/VS environment. It operates on DOS or OS and can reportedly recover multiple

and can reportedly recover mutuple files at the same time. DTA/Cobol costs \$4,800. A renew-able license is \$240 per month. DTA/ Recov costs \$3,800 for DOS and \$5,600 for OS. A renewable license is \$190 per month for DOS and \$280 per

Davis, Thomas and Associates 8800 Highway 7, Minneapolis, Minn

Atlantic Technologies, Inc. has announced Extools Paint, a graphics screen painting and sketching soft-ware tool for Computervision Corp-computer-aided design and manufac-turing system.

Extools Paint is said to allow users to edit and enhance picture images originally created with Computervision Image Design I software; to uch up CADDS2 drawings by re moving hidden lines or by adding text, labels, dimensions and annota-tions; and to paint graphics on the screen using a palette of mixable col-

A single-user system of Eztools Paint costs \$9,800.

Atlantic Technologies, 605, Woburn, Mass. 01801. P.O. Box

Users divided on System/88 direc og complaint ers, vendors facing up to break-b gencies' hacker troubles ed on bull

Radio Shack brings over 600 software programs within easy reach.



a rapped work

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Anto CAD series. And ill course, the ne lozens of pringrams and utilities and spisatically for programmers

We offe our fits sufficient you need to 1 every thing, humpersonalproduct as programs to help you awage your limances, my shruits earner at ay a radium enter with meteor training packages. And yes

There are over 70 pages pracked with programs in duding thosellers like we aphony and hand-to find fifthe like. His Proceedings Conference on the Feed these programs are await Feed this skell, or voir can under Fringle our Eyergs Order service. Radio / hack The Technology Store



A syou can more or less see, a typical \$600 terminal manages to fit 132 columns on a 14" screen. By crunching them together a lot tighter than normal. Which can lead to eyestrain, headaches, and just plain mistaless. All of which tend to be on the expensive side.

The TeleVideo 955 us designed to actually lor you read the sa

A you can clearly see, at TeleVideo" we've found a better way to you 132 columns on a 14" screen. By rea better way to you 132 columns on a 14" screen. By rea better way to you for the column of the screen and putting more space between them, we've given the DelVideo 955 the most readable 132 column falsplay available. And that's just the beginning. We've also given it a whole list of features you won't find on any other 132 column maching.

Like 64 non-volatile programmable function leav, With 512 bytes of dynamically allocated nonvolatile function key memory. Your choice of green or amber screen. And ergonomics that unlike Wysek, meet the human factors standards recommended for adoption by the American National Standards Institute. And you get all this for only 8629. Available options include WY-50/504 compati-

Available options include WY-50/50+ compatibility, graphics add-in board, and up to two additional pages of screen memory.

of course, therets an easy way to see how much more the TeleVideo 955 gives you. Just call the TeleVideo office closest to you. We'll give you the name and number of your closest distributor and send you full information right away. And if you'd like to check out a 955 from top to bottom, we'll help you eet an evaluation unit.

So get in touch and find out more about the highperformance TeleVideo 955. It's a real eye-opener.

♠ TeleVideo¹





Data base

management systems Software Research, Inc. has added the Data Entry and Menn modules to its Fasport-DBM family of infor-

mation management products The Data Entry module the user a method of building

data bases from previously entered The Menu module provides a way of linking and controlling various

programs of an application Fasport-DBM runs on any Conver gent Technologies, Inc CTOS-based package it costs \$1.200. The Data Fatry module alone costs \$500, and the Menu module costs \$100.

Software Research, Suite 210. 1991 Crocker Road, Cleveland, Ohio,

Training software

Advanced Systems, Inc. has an-nounced the SAS Library of five r-based training courses for

users of SAS Institute, Inc SAS soft The library includes SAS, a prerequisite that covers the basic bilities of SAS software: SAS/FSP, presenting methods for editing.

browsing and printing SAS data sets; browsing and promong users to the SAS/AF, introducing users to the SAS/AF, introducing users to the Graphics, and SAS/ETS

planning and forecasting facilities The courses are available under A library various pricing options rental plan ranges from \$50 to \$150 per module per month.

Advanced Systems, 155 E. Algon Road, Arlington Heights, Ill

MICROCOMPUTERS

Systems

GW Instruments has added the acspeech Lab to its Macadios prodnct line

Macspeech Lab is said to turn the Apple Computer, Inc Macintosh into a speech analysis workstation for poses of studying human speech and testing the speech impaired cording to the vendor, it can produce

spectrograms. The Macspeech Lab workstati consists of the GW Instruments Macspeech Lab software, priced at \$300. the Macadios hardware, priced at \$2,500, and the Apple Macintosh

P.O. Box 547. Instruments. Cambridge, Mass. 02142.

Trilobyte Compoter Corp. has an-nounced the Trilobyte V/PC, an in-dustrial NEMA 4 environment for a Zenith Data Systems Corp. Z-158 per-

MARCH 31, 1986

The V/PC was designed for severe industrial and field mobile environ-ments where humidity/hose off, corrosive gases, conductive particles

and other unfilterable contaminants are present It uses the Zenith passive backplane with all logic on standard plug-in modules. The basic system includes processor, memory and multifunction board and occupies cludes processor.

two Zenith slots. Base systems with Zenith Z-158 ngle-floppy system installed are priced at \$9,950. The chassis alone

Trilobyte, 801 W Grand Ave. Oakland, Calif. 94607.

HAVE YOU TALKED TO THE PEOPLE WHO DESIGNED WIDE-AREA NETWORKS FOR NATIONAL WESTMINSTER BANK. MICHIGAN BELL

AND WEYERHAEUSER? When these corporations evaluated

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corporate data traffic.

And for Weynharuser, we were chosen to baid a private wide-area new towice to baid a private wide-area new towice to integrate their corporate-wide facilities.

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SHOULDN'T YOU BE TALKING TO BBN?

BBN Communications

ett Street, Cambridge, MA 02238 ne 617-497-3258 Telex 921470

MAI Basic Four, Inc. has an-nounced the MAI 1500, a multiuser business Basic computer system The MAI 1500 is said to be a fully tegrated IBM Personal Computer AT-compatible system. It features an Intel Corp. 80286 microprocessor with an 8-MHz clock; a 1.2M-byte, % in. Noppy disk drive: 640K bytes of internal memory; a 20M-byte hard disk; an RS-232C serial port; an IBM

compatible parallel printer port; and an AT-style keyboard. The system can accommodate up to three users. Many options are chrome or color monitor and mass

The MAI 1500 base price is \$4,750 Four, 14101 Myford

Road, Tustin, Calif. 92680 Software applications

packages X-Y-See Software has announced Profit Maps, a graphics profit plan-ning system for the IBM Personal

puter and compatibles Profit Maps features a three-step process: It sets up an analysis, does e arithmetic and translates the re-

sults into pictorial maps Profit Maps requires an IBM PC or compatible with color/graphics board, 320K bytes of random-access memory and IBM PC-DOS or Micro-

soft Corp. MS-DOS 2. It costs \$495. X-Y-See Software, 32097 Buffalo Park Road, Evergreen, Colo. 80439.

Computervision Corp. has an-nounced the Personal Designer Fi-nite Element Modeler, an applications package for its personal computer-based Personal Designer

The package is said to provide an interactive graphics environment similar to mainframe-based finite element modelers. It provides native geometry creation, editing capabilities and finite element modeling func-tions. The software interfaces with a variety of finite element analysis

variety of titue creaming packages.

The package is available stand-alone or bundled with Macneal-Schwendier Corp.'s MSC/Pal.

Personal Designer Finite Element Modeler costs \$1,500. With MSC/Pal2, it costs \$2,500.

Computervision, 100 Drive, Bedford, Mass. 01730.



NEW PRODUCTS/MICROCOMPUTERS

Human Management Systems, Inc. and The Professional PC, Inc. have introduced Eric II, a human resource management system designed for cost/information analysis and

Eric-II is said to provide support for affirmative action, employm oyee relations, employee health and welfare, records and employee demographics, labor relations, wage/ salary administration, training and development. It includes more than 45 predefined reports plus a report

Eric-II operates on an IBM Pers al Computer or compatible with 255K bytes of random-access memory, a 10M-byte hard disk and a 132-col.

printer. It costs \$995

Suite 200, 12828 Northup Way, Belle-vue Wash 98005.

Software utilities

Signum Microsystems, Inc. has nced Documax, a document rement and text retrieval promanagement as gram for the IBM Personal Computer, Personal Computer XT, AT and compatibles

Documax is said to perform full text searches of standard Microsoft Corp. MS-DOS text files and to com ss text to 50% of its original length. Documax can search the full text of several files at a time at a rate of 100,000 word/min. using and, or and not logical relationships between arbitrary phrases. It compresses at a rate of 80 000 word/min

It costs \$150. Signum Microsystems, 120 Moun-tain Ave., Bloomfield, Conn. 06002.

Software Enhancement Teckno-logy, Inc. has updated its Hillte utili-

ty for Ashton-Tate's Dhase III. Hillite now offers Dhase III Plus compatibility as well as providing a way to incorporate more functional and visually appealing Lotus Devel-opment Corp. 1-2-3-style menus into Dhase III applications

Hilite for Developers includes Hilite for Dhase III, design specifications and commented source code. It erte \$149.95

Hilite for Dbase III costs \$99.95 and the Developers' Kit for upgrad-ing from Hillte to Dbase III costs

Software Enhancement Teckno-logy, P.O. Box 344, 390 Danbury Road, Wilton, Conn. 06897.

Phoenix Computer Products Corp. has announced Pforce, a li-brary of object-oriented functions and subsystems for the C program mine language.

Pforce is written in C and asse by language. It is available for com-pilers from Microsoft Corp., Lattice, Inc., Computer Innovations, Inc. and Wizard Computer Products Co. The product offers both high and low-level functions said to be fully integrated, optimized, debugge

It also includes source code for all functions and supplied utilities, the ndor said.

Phoenix Computer Products, 320 Norwood Park S., Norwood, Mass. 02062.

Auxiliary equipment

Touchstone Technology, Inc. has announced the Softswitch, an automanual printer switch that reported

ly uses embedded printer codes to di rect the parallel output of computer between any two par-

allel printers. Itswitch can be used as a ma ual A-B switch or as a fully automat-ic software-controlled or code-sensitive switch, according to Touchstone Technology

The circuitry switches all active lines and passes all acknowledgments and status signals to make the device compatible with all personal computers and parallel printers, the compa

ny said Touchstone Technology, P.O. Box 24954, 955 Buffalo Road, Rochester, N V 14524

COMMUNICATIONS

Controllers Compu-Mech, Inc. has added the CD4150 remote terminal unit to its

2Wire line The CD4150 is said to provide a range of analog and digital I/Os via the serial port on a computer. It features eight slots for plug-in modules, random-access memory and electri cally alterable read-only memory for data storage, RS-232, transistor-tran-sistor logic and a 1,200 bit/sec, modem serial interface. Each unit has a

witch-selectable address allowing 255 units to be placed on one commu nications channel. A fully configured CD4150 costs approximately \$2,000. Compu-Mech, Suite 75, 5242 Angola Road, Toledo, Ohio 43615

Protocol converters

KMW Systems Corp. has an-nounced the Series III Twinax and the Series III Coax, its Series III line of protocol converters

said

Both the Series III Twinax and the Senes III Coax offer three levels of on-board diagnostics, menu-driven programmability and pass-through le fur graphics data, the vendor

The Twinax allows attachment of local devices such as CRTs, printers and plotters to IBM System/34, 36 and 38 minicomputers. The 3287/ Coax allows local attachment of non-IBM output devices to IBM 3270 cluster controllers. prices range from

\$1 000 to \$1.500 KMW Systems, 8307 Highway 71 W., Austin, Texas 78735.



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meeting user demands. And provide experi
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If you're the graphics and of the business, you've seven begar reason to be in our May issue. We'll be discuss the least trends in the market and the hottest strictional graphs evidence. We'll see how the discussed MS/DP systems can be reaching systems. And the suching systems can be reaching systems are to reaching systems are to reaching systems are the reaching systems are most to our And, we'll help our reactors make the right hardware is outhware decisions for their own specials reach.

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e: May 14 - Closing: April 4

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Here's How Information Services And International Distribution Made It Happen



"Thanks to TELON, the new international on-line order entry system was completed six months

Ban Welf Director of Commercial System

"Three years ago, my department received the mendate — create a new, international, on-line order entity — create a new, international, on-line order entity with mix delender monthly the calculation of the second of the second

occose our productivity aimost immediately. The TELON pilot project created 50 MiS DB/DC programs, including order processing, on-line maintenance billing interlease, and invoice review. With a 2-toproductivity increase from detail design through strine test, TELON delivered complex applications in record time and brought the project in with savings in excess of \$60,000. The users, as expected, were delighted.

'in the three years since we installed TELON as the shops standar, where acided more than 700 MRS DBIO-programs to our production library and increased our maintenance productivity to about 5-to-1. TELON's powerful features 100 to 10

"The benefits of working with TELON are substantiel. Detail design, coding, and testing are reduced, so our overall timetrames are compressed by et least 50%. With quicker delivery of improved systems by smeller project teams, TELON has delivered a productivity payback that's corporate-wide."

"With TELON, we're doing more with less."



"We now process orders five times faster... and the reduced inventory overhead means the

John Helpep Director of International Distribu Travenol Laboratories, Inc.

"Travenol ships over \$200 Million in health care products to 96 foreign countries every year. When the world is your marketplace, the logistics are staggering. My department is called upon to coordinate inventory, order entry, shipping, lenguege and currency translation on a delity basis. Under the old system, the pressure was enormous.

"Working with Ben's group on the TELON pilot project, we created the opinial adultion — norder processing a yatem that lowers inventory and overhead. Hen's how it works. About \$200 cm. each working, our computer works and program extracts the necessary persevoir. Dools the cargo, and even electronically files the declaration with our and even electronically files the declaration with documents in Portiquaes, Franch, and Spanish. ... and it computes the prices in escudos, francs, and pessets, il necessary.

"The psykack was a timely as the operation we created. The entire system paid for Itself in four months", and since that time, it was paid for that months, and since that time, it was paid for that occurrented assigned \$11,000.00 in personnel, timestory, and operations in one year. Order processing time from our absolutes and entire processing time from our absolutes a softing days to just one. We've enhanced our ability to support the priorities of other decisions, as well as the company as whosh. The TELDAY place to proceed the sempland my international methods.

"Systems created with TELON enable us to make the best organizational use of information...and now there's no limit to what we can accomplish."

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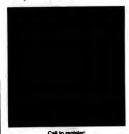
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-	Attention: Mr. Jack Luebeck 1-800/003-7395, in Illinois 312/985-6000	

NEW PRODUCTS/COMMUNICATIONS

Computer Peripheral Systems, Inc. has announced the T-2 and the T-4 multiport RS-232-to-two-wire direct in-terface (TDI) converters/ concentrators for the Bur-

concentrators for the Bu roughs Corp. TDI networks.

roughs Corp. TDI networks.
The T-2 is a two-port unit, said to convert two RS-232 devices to a single TDI line connection. The T-4 is a four-port unit that can convert up to four RS-232 devices to one TDI connection. TDI connection.

TDI connection.
The converters provide
the 83-282 electrical interface conversion for micros or
other terminals that operate
with Burrough poll and select software in micro-tohost in-house links.
The T-2 costs \$225, and
the T-4 costs \$325.
Computer Peripheral Systems, P.O. 80. 98282, Atlanta, Ga. 30359.

Software

Harris Corp.'s Computer Systems Division has an-nounced that its computers now support Blocked Asyn-chronous Transmission (Blast), the communications

(Blast), the communications software program from Com-munications Research Group. Blast enables Harris com-puters to transmit and re-ceive binary data files, text files and console commands simultaneously. Files can be transferred between Harris systems and any other sys-tem that supports Blast. Blast with a modem allows

Harris computers to serve as terminals to other systems. Blast on the Harris computers is priced from \$250 to

Harris, 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Network Software, I has announced NIP/Syst Product, a new release of its Network Information Package (NIP) for NCR Comten,

The offering collects infor mation necessary to manage and control a communica-tions network. Information is tions network. Information is gathered at every NCR Com-ten node in the network. It is then collected automatically to a central host data base and is available for analysis

using report generators.
NIP/System Product is available for all NCR Comten communications processors. The license fee is \$250 per

Network Software, Suite C110, 7 Mount Lassen Drive, San Rafael, Calif. 94903.

Multiplexers/modems Cedenoli Technology Corp. has introduced its Ce-denet-3801 and Codenet 3810 Piber Optie Modem Adapter/Extenders. The 3801 was designed for IBM System/34, 36 and 38

and

en terminals and printers to be placed up to 33,000 ft from the host. The 3810 was designed for IBM's 8100 Distributed Data

115M's 8100 Distributed Data Processing (DDP) System ter-minals and printers. It allows up to 63 terminals and print-ers to be placed up to 33,000 ff from each of the IBM 8100 DDP lobes.

Both the 2005

Both the 3801 and the 3810 typically cost \$795. Codenell Technology, 1086 N. Broadway, Yonkers,

N.Y. 10701.

Anderson Jacobson, Inc. has announced the AJ 4648-2, a 4.8K bit/sec. full-duplex

The modem is said to transmit data over the public two-wire, dial-up telephone network or private two- or four-wire leased lines with more-call automatic-dial back-up. It supports synchronous and asynchronous data transmission.

ares include in-Other feat tegral dialer controlled via modem or terminal, multilev-

el security and automatic er-ror detection and retransmis-sion in asynchronous

The basic AJ 4048-2 costs \$1,995. Anderson Jacobson Fo

Charcot Ave., San Jose, Calif

multiplexing products for the IBM 3270 local environment. The CM-299 Series offers the attachment of up to eight 3270 Type A terminals and printers to IBM 3274 control-

rs. The CM-2132 Series offers The CM-2132 Series offers solutions for 32 ports multi-plexed from up to four differ-ent controllers.

The LN-200 Series offers support for single 3270 de-vice connections to the 3299 multiplexed cable and direct

emember When the Robot Was

The CM-299 costs \$990 The CM-2132 costs \$2,700. The LN-200 ranges from \$350 to \$1,500.

n, 8871 Bond St., Overland Park, Kan. 66214.

SYSTEMS & PERIPHERALS

Turnkey systems

(CURE) color matching sys-

CURE is an interactive computer system said to pro-vide graphic as well as nu-meric representation of the level of a sample's match or the deviation from a match hen compared against mas-r colors or other samples. It utilizes a color chip vid-

era and a digitizing The system operator ha the ability to choose any size color region within the view-

ing area and compare it against any other region in the viewing area or against coupler.
TDQ-QIC is said to have a stored results from previous

CURE is priced at about Megatronics, 4095 Chicago Grandville, Mich.

> Data storage The Western Peripherals vision of Wespercorp has nounced the TDQ-QIC

processor along with inter-face and control electronics to emulate the Digital Equip-ment Corp. TS11 and TSV05

It contains an 8K-byte data buffer expandable to 32K bytes. In addition, TDQ QIC features a drive address system in which each coupler and drive subsystem has its

tape dimension Q-bus QIC-02 own address.

Each coupler can support se drive. The price is drive.

one dri \$1,250. ngle-standard dual-width percorp, 1821 E. Dyer Santa Ana, Calif.

> Flexatar Corp. has announced the PS6000 Series Analog/Digital SCSI Disk Drive Test System, said to be capable of analysis of the head-to-disk interface of Wissberter disk for series head-to-disk interface of Winehester disk drive small computer systems interface (SCSI).

The PS6000 Series repo The PS6000 Series report-edly uses test points embed-ded within the drive to pro-vide a full range of analog/ digital tests including timing, head disk assembly, read channel and phase-locked loop tests. The units are self-

brating during operation Four configurations are available: the FS6001 personal computer compatible, including SCSI test board and analog controller board plus vertical/horizontal marginvertical/horizontal margin-ing probe; the FS6002 PC compatible, including SCSI test board only; the FS6011, including the SCSI board, analog controller board and margining probe; and the PS6022, with SCSI test board

Prices are \$11,995 \$9,995, \$8,995 and \$6,995

respectively.
Plexstar, Suite 204, 780
Trimble Road, San Jose,
Calif. 95131.

Terminals

Barcode Industries, Inc. is enhanced the MR-2 terthat links up to 16 bar code readers in a daisy chain to a

single computer port.

MR-2 is now available with a two-line display that can be used to monitor bar de data sent to the host.

The host can also report display.

In addition, handheld or fixed-mount laser scanners can now be connected to dai-

sy-chained units on the MR Net, according to Barcode In The MR-2 with a display

costs \$945. Barcode Industries. arstow Road, Great Neck,



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To say the very least, what started as nothing more than a futuristic novelty act, tomorrow's conversation piece, is now a given, an important, productive piece of standard operating equipment for factory automation.

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sying catch-up and reacting to hande, headaches and hang ng your system.

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rolves an ongoing industry nember, this is a service. sell no hardware, lease no and repair no equip

at we do sell is in el of expertise avai es a day (we never clo We're a wish that's a reali We're a service that will

become as important and accepted as the robot. sured Cor

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COMPUTER INDUSTRY

Software vendor seeks perfect fit in products, philosophy

DDA sells no financial program before its time

Maura McEnemey SUNNYVALE, Calif. — Mainfras software vendors do not often walk away from a \$100,000 sale to a major away from a \$100,000 sale to a major insurance company. But Data Design Associates, Inc. (DDA) has done it more than once. "We have walked away from business when we felt the company's software requirement and

our system wasn't a good match, claims DDA President Dave Lowry Twelve-year-old DDA has carved Twelve-year-old DIA has carved out a spot in the financial applications market among giant softwarevendors like Management Science
America, Inc. (MSA) and McCormack
& Dodge Corp. (M&D) by providing
the "good matches" that Lowry describes. Last year DIA made \$1.2
million in profit on \$10.5 million also
sales and expects sales of \$15 million. for the current fiscal year ending to-

But DDA's strategy has also lost the company a few friends. "Some people feel kind of insulted when you tell them they don't have the type of support group needed to make our products successful," Lowry says. DDA was founded in 1973 by Low-ry, a former technical manager at MSA and program developer at West-

ern Electric Co. The company is en-tirely owned by its 100 employees, all of whom participate in policy deci-sions and hiring selections. The com-

pany perhaps epitomizes impressions of the California high-tech lifestyle — health club memberships, mountaineering outings and beer blasts are

and beer times all part of the beneof our primary goals is to have fun," one worker

says. But the workers take their company seriously. When pod emviewed, any interested employee can sit in on the interview and pose ques-tions to the candi-date. Managers

cisions. There have been occas when coworkers vetoed a manager's choice of a hire "I was here interviewing for three days," says Jody Bennett, an account manager for DDA's Accounts Payable manager for DDA's Accounts rayance system and the company's 43rd em-ployee. "At times there were as many as 20 people sitting in on the inter-

Annual retreats to mountain a key decisions and management train-ing sessions. At this year's retreat, workers tested their creativity when

groups were given a box of miscellaneous items and told to invent a ma-chine that could push a ping-pong ball off a table and into a paper cup.
At the same retreat, workers vot-

ed to restrain growth to no more than \$18 million in revenue next year. "A lot of employees felt the company was growing too fast," says Vicesays Vic. George President Proudfoot

Nonetheless, DDA hopes to be a \$50 million company in five years. Dataquest, Inc. soft-ware analyst Paul Cubbage, howev-er, says DDA will hit a maximum of

cr, says DDA will fit a maximum or \$30 million in sales. DDA's products include General Ledger, Accounts Payable/Purchase Control, Fixed Assets and Capital Project application packages as well

the accounts payable marketplace,

share of MSA and M&D. share of MSA and M&D.

According to Cubbage, DDA's product design philosophy will limit how fast it can grow. Beta test sites are never used for product testing, for example, often delaying product delivery dates.

Lowry "has always had a policy that we don't do beta testing," says Mike Kalser, product research director. "If products at beta sites need changes, then you haven't thought through the system. We want our development people to know they are not going to have another shot at the

Such philosophies can create pr uct cycles that would be intolerable uct cycles that would be intolerable elsewhere in the industry, but DDA sticks to its guns. "Waiting four years to release a prodoct is not unusual at DDA," according to Proudfoot. "Our philosophy is to do small amounts of business but really do them well. We believe in expanding our product line but drive it in the property of the product is about the product of the product in the product of the product is about the product of the produ r product line but doing it slowly When you bring out a product, it's a tremendous drain on the company, and if you rush it, the quality and

control go out the door."

DDA admits that its sales suffered
while it waited to bring out a general
ledger package. "When we started



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COMPUTER INDUSTRY

Tide fails to lift industry's boat

ng soft industry conditions. Wall kreet has responded by lowering Big lue earnings estimates to the \$12 inge, up from last year's \$10.67 per share, while projecting a revenue increase of about 10% to \$55 - significantly below IBM's stated corporate goal of 15% annual

Firms such as Burroughs Corp., Concurrent Computer Corp. and Con-vergent Technologies, Inc. (now known as Convergent) are also cautioning the investment community t somewhat lower results

through the third calendar quarter. The downbeat mood, for the most part, has caused investors to shy away from computer industry issues. Moreover, bad memories still linger from 1983, when highly touted and richly valued new computer industry issues such as Miniscribe Corp. and Priam Corp. flooded the market.

at half their initial offering price. The computer industry has not een able to recapture the imagina tion of investors nor recapture the growth of the past," notes St sad, an analyst who tracks the com-puter industry for L. F. Rothschild, Unterberg Towbin in New York. Whereas people accepted as true that technology stocks would forever be growth oriented with a high degree of insulation from overall economic pressures and factors, the op posite has proven to be true," he

In addition to slim corporate prof its, another factor affecting trading omy short-term ou tal equipment spending.

DDA looking for perfect fit

developing a general ledger package, it was a very hot market," Proudfoot recalls. "In the year or so that we took to put it out, the general ledger market was saturated. Had we not waited, we could have caught that wave."

pproach to product developments. They have very clean releases sys Arthur Hussey, manager of financial and bank support systems at Lloyds Bank California.

Lloyds Bank California.
Lloyds runs DDA's Accounts Pay-able and Pixed Assets Accounting package. Keith Weber, project man-ager for financial systems mainte-nance, says, "We haven't been down

nance, says, "We haven't been down one day because of a production problem caused by the system." The future looks promising for DDA, according to Cubbage: "They have a solid product, happy customers and money coming in. That looks like a pleasant world, indeed."

According to projections recently released by the New York investment banking firm Smith Barney, Harris Upham & Co., capital spending is ex-pected to decline by 11.3% in the first quarter of this year compared with the fourth quarter of last year. In the second quarter, capital spending is expected to increase 4.9% compared with the first quarter. For calendar 1986, capital spending is expected to by 2.6% compared with

"That compares with capital spending increases of 22% in 1984 over 1983 and 8.6% in 1985 over 1984," notes Tim Summers, a Smith Barney analyst. "We expect it to pick up to 7.8% in 1987 over 1986 and

10.9% in 1988 from 1987 Unlike some analysts, Summers is are outperforming most computer in-dustry firms. "This is because denot painting computer

a company-by-company basis," he says. "IBM is not saying very good things, and its stock has suffered. On the other hand, Digital Equipment Company and the saying th Corp.'s stock has doubled in the last

12 months."

Bob Grandhi, who follows the soft ware and services industry for E. F. Hutton & Co., agrees with Summers "In the software business in analysis.

particular, you can't put all the companies under one umbrella," Grandhi "Software AG of North America, Inc. is doing well and so is its stock. Cullinet Software, Inc. is not and neither is its stock." In the services sector, Grandhi says that most of the firms he track such as Automated Data Processing. Inc. and Computer Sciences Corp.,

siness on a long-term contract asis," he explains.

The recently completed initial

blic offerings of Microsoft Corp. and Oracle Corp. are indications that. despite the overall negative p tion of the computer industry, there continues to be interest in young companies that have proper season A hidden bright spot in the bearish

nter outlook, L. F. Rothschild's Ossad says, is that everyone remains so negative on the computer indus try. "It's a hair-trigger situation," he says. "A lot of first- and second-tier technology stocks have not partice pated in the rally. People who have made money in other segments of the market might be ready to rotate their money into computer industry shares. I'm not sure about when or



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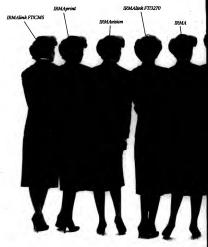
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COMPUTER INDUSTRY

Datapoint forecasts calm after 1985 takeover, spin-off storm

CEO predicts 'return to profitability' in 1986

James A. Martin SAN ANTONIO — There would be little argument with the opening words of Datapoint Corp.'s most recent annual report: "Fiscal 1985 was a year of dramatic change for Datapoint as well as the computer indus

try as a whole. For this troubled minicomput orporation, those changes include the following: · A company takeover by Asher B. Edelman, a New York financier who is known for liquidating firms for

their assets.

• The spin-off of Datapoint's service and support division as a sepa-Intelogic company, Trace, Inc.

• Fiscal year net losses of \$48 3 million A spate of lawsuits alleging violations of securi-

ties laws. three new products to an industry already suffe

most accounts, from product overload Despite Edelman's repu tation for liquidating companies for

such plan for Datapoint at this time,

according to President and Chief Ex-ecutive Officer Edward P. Gistaro. "Edelman has been chairman of the board now for one year

and he hasn't liquidated anything yet," Gistaro says. "He spun off Intelogic Trace because he felt there was a real chance available in the stock market for a service company, and he's certainly been proven cor-

after Edelman began his takeover of Datapoint, Inte logic Trace is trading at about \$20 per share. "Combined with the price ere appears to be no

share." Gistaro says. off Intelogic Trace, the total con ny was trading for less than \$12 per share. So that action alone has d bled the value to investors, without

liquidation or anything else intelogic Trace recently reported cond-quarter 1986 earnings of \$5 illion, compared with pro-forma million, cos earnings of \$4.5 million for the year

Edelman and Datapoint board member Churies P. Stevenson head an investor group that initiated a \$6 per share leveraged buy-out offer of

oint in September 1985. The group is in the process of arranging nancing plans, which are expected be completed by the end of the curof Datapoint, that's about \$25 per to be completed by the rent quarter. April 30.

Gistaro says he believes the g has a "70% chance" of acquiring the financing and shareholder votes needed to take Datapoint private. Even if the financing is not complete by April 30, efforts will be continued to wrap up the deal beyond that point. But despite the outcome, Dataoint's strategy will not be greatly al:

red either way, he adds. Although 1985 was a knuckle year for Datapoint, 1986 is expected to be relatively stable and profitable, at least in comparison am looking for the balance of fiscal 1986, which ends in early August, to be a period of continuing improve

be a period of continuing improve-ment in product orders and a return to profitability," Gistaro says. Gistaro bases his remarks on the industry's outlook for an improved economy for 1986, the company's recent marketing strategy of focusing on its installed base of customers and its hopes for a corporate image re-bound following Edelman's takeover.

But the company's business chal-lenges remain obvious — and formi-dable. Although Datapoint is general ly considered a good engineering technology and product-oriented company, many potential large users are skeptical about the company's stability and, therefore, shy away from its products, according to Wil-liam C. Rosser, vice-president in charge of small computer systems at the Gartner Group, Inc. in Stamford,

'Datapoint has had quite a history of problems that have gotten pro-gressively worse," Rosser says. "A significant amount of employees significant amount of employees have left because they can find onhave left because they can must op-portunities in other companies with-out all the troubles, and that's hurt Datapoint. Even though the company is known for fairly good products,

in cetting those products position in the market. Gistaro is optimistic that Data point's product strategies will strengthen ties to its current custom ers and, eventually, create new ones. To accomplish this, the company is building a family of products using its Attached Resource Computer local-area network and Resource Ma agement System proprietary operat-ing system as a foundation.

positioning the Starfleet processor-line as its flagship product. The first of this series, the 16-bit Starship I, was introduced in September 1985. was introduced in September 1995.
Starship II, due out in mid-year, will include interfaces to Corn's MS-DOS and Unix.

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COMPUTER INDUSTRY

Industry supports Senate bill

Tax reform proposal would spark R&D

By Mitch Betts
WASHINGTON D.C. — The U.S. Senate Finance Committee's draft bill for federal tax reform would treat the computer industry even better than did the bill passed by the U.S.

House of Representatives last year.
Although the thrust of tax reform legislation is to repeal most busines tax breaks, the proposal drafted by Chairman Robert Packwood (R-Ore.) would make permanent the 25% re-search and development tax credit, just as the computer industry had sought [CW, Dec. 30, 1985/Jan. 6,

Packwood's proposal also would nate the 10% investment tax credit, cut the top corporate tax rate to 35% and put computer equipment in a three-year depreciation catego-

In an effort to make his plan appealing to members of the committee, Packwood inserted numerous special tax breaks favored by com members, such as the R&D credit extension favored by Sens. Lloyd Bent-sen (D-Texas) and John C. Danforth

(R-Mo.).

The House bill trammed the R&D credit to 20% and extended it for three years. The credit expired at the

The Computer and Business Equipment Manufacturers Associa-tion (CBEMA) has a "very positive view" of the Packwood proposal, ac-cording to spokeswoman Charlotte

The Coalition for the Advance-

The Coalition for the Advance-ment of Industrial Technology also praised the Packwood proposal for its treatment of the R&D credit. Co-alition leaders include representa-tives from IBM, Hewlett-Packard Co. d CBEMA. The proposal, which the Senate emmittee will use as the starting point for writing its tax reform legis

lation, gives the computer industry more favorable income tax rates and depreciation schedules than did the se hill Packwood's proposal cuts

maximum corporate tax rate from 46% to 35%, a move supported by high-technology firms in high tax brackets. The House bill cut the top

rate to 36% "Keeping rates low is even more crucial because of the proposed end of the investment tax credit, which has been a major economic boost both to our industry and to our custom-

according to Ted A. Heydinger, a CBEMA vice-pre The Packwood proposal places computers and advanced tele munications equipment in the threeyear depreciation category, rather than the five-year category set by

Chilly effect of insurance crisis

From page 110

too passive in their responsibilities to stockholders." The directors' liability chill has

given birth to the latest wrinkle in investment banking services: the fairness opinion. The theory is sim-ple — the boards on both sides of a potential deal seek an impartial ex pert opinion on the transaction, creating a prevention of, or at least defense against, future litigation

But, alas, investment bankers do not come cheap. Fairness opinions generally command six-figure Jees maybe peanuts in the context of eight- or nine-figure mergers, but nonetheless a new expense that didn't use to exist at all.

Directors can be sued for a wide variety of actions, but a merger or acquisition, with its major impact on cash resources, corporate direction and organizational structure, can be an easy target if things go sour for the shareholders.

"Acquisitions are so visible," says Robert J. Conrads, the new vice-president of mergers and acquisitions at Kidder, Peabody & Co. "There have been a lot of had ones in this indu try in recent years, and the market remembers that." Both Goldstein and Conrads, how

ever, remain reasonably optimistic about the mergers and aquisitions climate for computer companie

Conrads points out that there is po-tential director's liability for not fol-lowing through on a deal if all indicators are right — a cash-rich acquisitor eyeing a solid, technology rich firm that fits perfectly with the acquisitor's product line, for example. And he notes that many poten et line for exam tial buyers have high stock valua-tions right now, a leading indicator that they may be shopping.

e net effect of the directors bility dilemma may well be that the quantity of mergers and aquisi-tions goes down while the quality goes up. Boards on both sides will be much more careful, and a company sitting on a pile of cash won't be ng every software start-up it tech firms in that position have done just the opposite, using the cash to buy back their own stock

The lessons of formerly acquisi-tion-minded firms like Control Data Corp., Informatics General Corp. and Management Science America, Inc. stand out now more than ever, Conrads says. You won't be seeing companies ranging far out of their core markets to buy up subsidiaries with a questionable relevance to their main purpose. The risks are higher

But that doesn't mean the pace of sensible, logical partnerships will slacken. In fact, Broadview's Gold stein notes with irony that there is a quick way for a jittery board to relinquish control of its company inquish control of its company, thereby removing itself from liabil-ity. "That way," he quips, "is to have their company be acquired."





DIGITAL CONTROLS



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The power to share

The Eandy 3000 is also designed to use the forthcoming XENIX 5.0 multiuser operating system. Two to six people in an office can use the 3000 simultaneously with low-cost data terminals.

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The Tandy 3000 comes with an 80286 cpu for the ultimate in speed and performance. Its 16-bit architecture operates at 8 megahertz—twice that of the industry standard.

The Tandy 3000 comes with one-half megabyte of main memory (512K RAM). Memory can be expanded to 640K without using an expansion slot. Total internal memory can exceed 12 megabytes (under KENIX).

meganytes (under ALPIA).

As for storage, the Tandy 3000
(25-4001, \$2599) comes with a high-capacity, 51-47 floppy disk drive. For the utmost in compatibility, this drive can read 1.2-megabyte and 360K formats for use with 1BM PC diskettes.

use with IBM PC diskettes.

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built-in 20-megabyte hard disk drive.

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COMPUTER INDUSTRY

Kapor steps down as manager of Lotus division

CAMBRIDGE, Mass. — Lo-tus Development Corp. an-nounced last week that its founder, Mitchell D. Kapor, founder, Mitchell D. Kapor, will step down as general manager of the company's Business Products Division (BPD). He will be replaced by Daniel A. McMillan in a tran-

sition effective April 2. The action took observers surprise and indicated

that Kapor is reducing his in-volvement in the company's day-to-day business activi-ties. Kapor had taken the helm of the Business Products Division in October 1985, in a move that the company said indicated Kapor's intention to become more in-volved in Lotus' daily busi-

"When I assumed day-to-

day operating responsibil-ities at the BPD, the assignities at the BPD, the assign-ment was to take as long as necessary to launch a series of new development and op-erating initiatives," said Ka-por, who will remain the company's chairman. "Now that those initiatives are well

under way, it's time to turn ponsibility over to a per-nent management team."

McMillan, 53, is currently the publisher of Lotus Magarine, which Lotus publishes for users of its 1-2-3 and Symphony software. That post will be filled by Lotus Sales and Markethng Director James R. Pierce, former publisher of Business Week magmarketing post

e. Lotus has yet to name a successor to the sales and



Trilogy Ltd. recently reported more bad news as its Elxes supermini subsid-iary laid off 30 of its 260 employees. The cuts fell mainly in manufacturing and did not affect product and did not affect pro-development or customer support. "We are able to fill current demand from mining inventory," said existing inventory," said Peter Appleton-Jones, president and chief executive officer of Cupertino, Calif.-based Elxsi.

Calif.-based Elxsi.

Citicorp has made an offer to acquire Quotron Systems, Inc. in a cash merger for \$19 per share, or about \$680 million. Quotron, based in Les Anselses provides stock outgeles, provides stock quo-tations and data base ser-

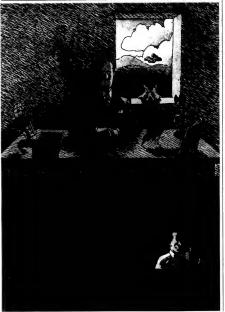
Micropro Internation al Corp. reported second-quarter revenue of \$10.5 million and profits of \$863,000, or 7 cents per share, compared with year-earlier revenue of \$9.9 million and a loss of

Digital Equipment Corp. recently announced a two-for-one stock split. The shares will be distributed as a 100% stock dividend. The last time DEC split its stock was in 1976

Fujitsu America, Inc. said its subsidiary, Fujitsu Imaging Systems of North America, had reached an America, nao reached an agreement to acquire the North American opera-tions of Burroughs Corp.'s Danbury, Conn.-based Im-aging Systems Division for approximately \$20

Micron Technology, Inc., the Boise, Idaho-based semiconductor firm, said second-quarter reve-nue dropped to \$9.4 million from the year-earlier level of \$18.2 million. A loss of \$9.8 million, or 51 less of \$9.8 million, or 51 cents per share, was re-ported for the quarter, compared with a profit of \$2.8 million, or 15 cents per share, in the samequarter a year ago.

Gould, Inc. said it ac-quired PSC, Inc., a Fair-fax, Va.-based computer and electronics systems engineering firm. The terms of the acquisition



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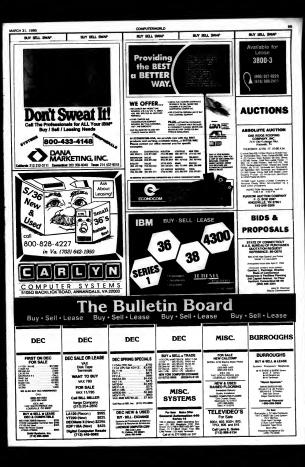
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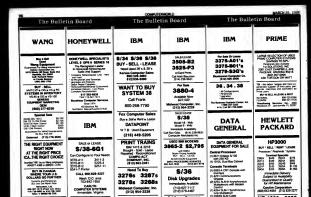
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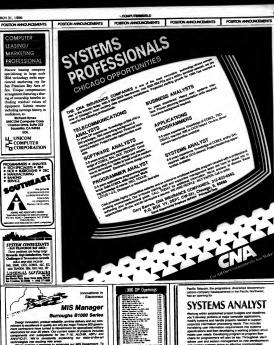
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IRM files trademark suit

By Clinton Wilder IRVINE, Calif. — IBM has filed a trademark infringement suit against a managed or accomment broker for us

ing the toll-free phune number. 1n-IBM-USED, in its advertising The suit, filed Feb. 26 in U.S. Di trict Court in Los Angeles, asks the court to order Marshall Lewis & As sociates, Inc. to stop using the three letter abbreviation and seeks unspec-

Marchall Lowis on Severald hro selling and leasing mainly IBM mid-range systems, uses the number prominently in advertisements in Akers' rise makes

smooth transition

the president's reins from Cary in

ingli-volume production strategy that enabled the mainframe giant to

the microcomputer business. The

IBM manufacturing facilities and re-

components at costs well below IBM's

months from now, Akers will become

ntive officer and chairman since Cars did so in 1973 Analysts foresee

chairman to make his mark during a

the future direction of the company

Research's Diurdievic explained

Opel has been pretty much a care

taker chairman, carrying on the di rection set out by Cary. Akers' chal-

tinel's aggressive expansion philoso-

challenging time in IBM's history

Itt-year era for the 51-year-old

Because of his age, Akers is in the

extron to put a personal imprint on

to be another Cary type." Annex

lying on outside suppliers to pro

the first man to hold simultan

man in February 1983

sary 1981 and moved up to chair

umental in forging IBM's low-cost

ete in and eventually dominate

s to his strategy were automating

From page 110

Computerworld and other trade pub-IBM alleged that the use of its

name is "misleading and deceptive" and implies that the defendant is affillated with IBM " said Marshall Lowis President Al Binder, "We have done about 3,000 transactions, and

there is no way that any of our customers thought we were IBM pre the lawsuit was filed. IBM asked Marshall Lewis in writing to halt its use of the name, and the cor pany refused to do so, according to

roduction capacity "

Most analysts said they do not expect Akers to relinguish the presi

for at least a year while he consolidates his power. But speculation was rife last week as to whom he would eventually name as president. nt and chief financial officer, Jack D. Kuehler, senior vice-presi-dent in charge of worldwide manufacturing, have been mentioned as likely successors, but both are two

years older than Akers and might be passed over, analysts said. I would look for someone who is known and younger than Akers to be named president William Easterbrook of Kidder, Pea-

body & Co. "Akers is young and will be there for eight or nine more years at least. That's a long time for anyone

younger dark horse in Vice-President and Group Executive George H. Con-Trade Americas/Far East Corp. 'Traonally, IBM has filled that role with marketing rather than financial types, which goes against Krowe," he d. "How long Akers waits will be a function of how fast a new star

IBM also said it expects to cease nufacturing its Personal Comput er ATs and XTs at its Austin, Texas, plant by 1987 Production of those is to hold down Cary's and offerings will shift to Entry Syst Division plants in Boca Raton, Fia plis until demand catches up with

Positive market conditions make for a Wyse investment



an the news at Wyse Technology, Inc. get any better? In recent weeks, Wyse - 14%) climbed to no highs, reflecting positive market conditions and renewed investe confidence in the ASCII terminal company. That confidence was tem norarily shaken in January when Computer Systems a it would sell its 30% stake in Wyse. Wyse's stock, at current levels, re flects belief that Altos will remain a

Severtheless, Wyse continues to trade below market value, or the average price/earnings multiple at currently trade stocks. "If you believe Wyse will earn \$1.60 a share in its fiscal 1987 ending March 31, 1987," says Gibbs Moody a securities analyst with

major OFM customer

Gartner Securities," to believe the stock is currently un-For Wyse's current fiscal year ending today, most analysts esti-mate the company will carn about

flon, a 67% increase over fiscal 1985 sales According to Walter J. Winnitzki

assistant vice-president with L. F Rothschild, Unterberg Towbin Wyse is expanding into new video deplay markets by leveraging its expertise in display technology high-volume and low-cost manufacture turing, research and development agement. "The future of Wyse," Winnitzki says, "is clearly outstanding and the company ranks as perhaps the strongest terminal vendor right now.

Fueling optimism for Wyse's

Parteus is president of Strand Research Associates, o Centerville, Mass-based company that provides reb services for fi name int and high tech firms

ising new products and expanding distribution opportunities among Fortune 1,000 companies and One of Wyse's most exciting ne roducts, according to Moody, is the WY-700 graphics monitor, a high margin product providing 1,280- by 800-pexel resolution, bundled with a graphics board. A few weeks ago. Wyse began quantity shipments o the high-end graphics monitor to its distributors. Moody says he would

not be surprised if Wyse decides to distribute its WY-700 un der the label of Amdek Corp., a Chicago-based monitor maker that Wyse acquired last month Analysts say Wyse's 1987 fiscal year should benefit from a new sgreement with Businessland, Inc.

which will distribute Wyse products to Fortune 1,000 companies is also making a major push in its overseas business, Leung, vice-president with Smith Barney, Harris Upham & Co., "an the U.S. dollar is helping these ef-

What about prospects for Wyse's bread-and-butter terminal bus According to Winnitzki of L. F Rothschild, many investurs fail to realize that the terminal industry is still growing in particular. Wyse benefits from healthy demand for

multiuser systems, from which AS-CII terminals hang me analysts admit being un comfortable with Wyse's growing participation in the personal computer market, which now accounts for about 20% of company sales Other analysts regard Wyse's personal computer strategy as a natural enabling third-party integrators to ms offering both re mote and local processing capabili-

Vet in comparing Wyse with its must tors most analysis agree that Wyse stands in a league by itself. "There are, of course, no tees in the investment busi "Gartner's Moody observes, but the risk in investing in Wyse does not seem great at this tim

3Com merger: Cold feet at the 'alter'

san Just, Calit.— The pro-posed merger between Convergent Technologies, Inc. and 3Com Corp. was blessed by analysts at the out-set, but the feeling in the wake of last week's concellation was that it was not exactly a match made in

of cheers at the 3Com offices when news of the falled swrger broke and even

nned to reject the merger proposal had it come to a vote The failed merger left behind ome disappointed executives who orked closely together for months

to finalize merger details. Some 3Com employees were already working out of the Convergent of-fices, and the "new Convergent" ming to ann

Although executives at both com-nies hinted at the possibility of

es hinted at the possibility of sociating the merger agree-it is unlikely that will hap-"This has got to be fraught all sorts of emotional bag-gage," and Dataquent, inc.'s Gwen Peterson. "It may be more painful

ate."
"Convergent was not the best
match for 3Com; they could have
done better," said Lissa Morgenthaler, editor of the "California
Technology Stock Letter." "3Com is in a low-end business and looking for a big, strong company to align themselves with. They were run-

ning for cover faster than they needed to."

Convergent, 3Com merger collapses

with four other top executives in November to found the Dana Group, a supermicrocomputer company in San We were going to have a little celebration here. I thought that Paul Fly had an inspired idea. I thought both the people and the products

were very complementary The possibility of a future 3Com merger has not been ruled out. "This is a cooling down pe-

Krause said In the meantime, 3Com and Con vergent are expected to pursue joint marketing agreements for electrons

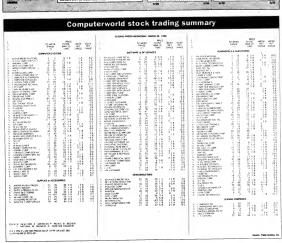
mail and office graphics software as well as future OEM agreements 3Com is developing a network file corner that could be integrated into Convergent systems, according to Da taquest. Inc. analyst Gwen Peterson

Over the past several months, we ave been developing a number of products of interest to Convergent's OEM customers, and they have been working on several products of inter-est to us," Krause said 3Com provides Ethernet networking products for Convergent's Ngen work The merger halt will have little efaron Data Systems, a San L

andro, Calif., systems integrator in which Convergent holds a 40% interest, said Baron Chairman Charles Davis. "Naturally I'm disappointed, but I don't think it's the end of the world by any means," Davis said.

COMPUTER INDUSTRY





COMPUTER INDUSTRY

INSIDE

Datapoint seeks calm after a stormy 1985/88 The computer in-

dustry favors the latest Senate tax bill, which includes a 25% R&D tax credit/90

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INSTANT ANALYSIS

"We're going to get back to business and forget about investment hankers

Kers.

— Paul C. Ely Jr., resident and CEO, Convergent fechnologies, Inc...

IBM's smooth succession

Akers' chairmanship won't disturb the Big Blue waters

By Alan Alper and Clinton Wilder ARMONK, N.Y. — The ascension of IBM President and Chief Executive man following John R. Opel's re tirement on June I will have minimal impact on the industry leader's strategic direction or its day-to-day operations, analysts and observers said after Opel's

It is an orderly succession noted Stephen Dube, an analyst with Shearson Lehman Brothers. John R. O Inc. in New York "18M mar are usually uf the 'don't make waves' vari-As chairman, Akers adds long-term

planning to his current roster of responsi

Blue again," said veteran IBM observer Bob Djurdjevic of Annex Research in Phoenix. "Retiring

IBM executives keep their finger in the nie, then are phased out gradually Even Cary has continued to be active at

Opel, a 37-year IBM veteran, took over See AKERS page 108

bilities, which primarily consist of day-to-day management of the \$50 billion compa-ny, an IBM spokeswoman said. Analysts

said they expect little change in the firm's

strategic direction since many of the major corporate decisions emanate from already-

Opel, 61, will remain on the board and assume chairmanship of the

assume chairmanship of the powerful Executive Committee from retired IBM Chairman Frank T. Cary on April 28, the date of IBM's annual sharehold-ers' meeting in Houston.

Onel will clean out his desk on

June 1, drive away and nev

No one should think that

Rising stock market tide fails to lift the computer industry boat

Despite Wall Street's recent robust enasm toward publicly traded stocks, most computer industry issues, to few analysts' surprise, are not participating in the

Although the Standard & Poor's 500 in dex is up some 40% over the last year, a thorough sampling of publicly traded computer stocks shows that the shares of most corporations are only slightly closer to their 52-week high than they are to their one-year low. Firms that are indicative of that trend include Apollo Computer, Inc., which has been trading in the \$16-pershare range: Data General Corp., which has hovered in the \$37-per-share area, and Wang Laboratories, Inc., which remains at

oproximately \$22 per share.
"It's a reflection of current business anditions," says William Easterbrook, an

conditions analyst with Kidder Peabody & Co. in San Francisco. "In the end-user portion of the business, demand for computers varies from poor to awful, and there is no signifiand change foreseen

Indeed, Easterbrook points out, that order weakness is an industrywide phenom-enon, damnening investor spirits as well as sales and earnings projections at many computer concerns IBM, over the last couple of quarters.

onished the financial community to expect minimal sales and earnings increases over last year because of co See TIDE page 85

Cirton Wider

Chilly effect of insurance crisis

big chill is spreading through A big chill is spreading through the boardrooms of corporate America with the potential to threaten the rapid pace of mergers and acquisitions in the computer industry The phenomenon goes by many name but for simplicity we will call it the "directors" liability insurance crisis." As Time magazine noted in a recent cover story, liability coverage on every thing from tobacco products to ski lifts to playground swing sets is fast becom

ing either prohibitively expensive ur virtually impossible to obtain. The cor-porate boardroom is feeling the same effect on the cost of its protects against shareholder lawsuits for alleg-edly imprudent business decisions. By all estimates, the number of such su like just about every other kind of suit has skyrocketed in the last decade The implications for board members considering an acquisition move or an

acquisitor's offer are obvious - partic ularly if theirs is a smaller company that recently decided to risk going without directors' hability because of spiraling premiums. It all adds up to the strongest barrier against decisive corporate action: fear "Anything that makes boards more

fearful is probably not healthy," say Bernard Goldstein, a partner in Fort Loo N. L. harnd Broadview Associates une of the software and services industry's premier merger and acquisition orchestrators. "Too many are already

Wilder is Computerworld'a senior editor, computer industry.

Merger of Convergent, 3Com suffers 11th hour collapse

Investment bankers reassess equitability

Maura McEnancy SAN JUSE, Calif — The expected merger between network products vendor 3Com Corp. and systems man ufacturer Convergent Inc. fell apart at the 11th hour last week after investment bankers told Com board members that the merger plan was not in the best interest of Cum shareholders

Last Tuesday, just two days before invergent shareholders were Convergent scheduled to meet and approve the merger, San Francisco-based investment bankers Robertson, Colman & withdrew their previous own that the merger plan to exchange each outstanding share ck for one share of Conver-

gent stock was fair tu 3Com share holders. The favorable fairness opin ion was a condition of the merger The revised opinion rejected only the previously negotiated terms of the \$133.6 million merger, not the concept of a 3Com-Convergent partpership. But immediate attempts to renegotiate the merger agrees failed, and the merger was called off on Wednesday. "I'm sad and disap-pointed that the merger didn't work out." "Com. President L. William 3Com President L William

Krause told Computerworld. Convergent President and Chief Executive Officer Paul C. Ely Jr. was noticeably upset about the last-min-ute change of opinion. "We had three months to put this deal together," Ely said, "then a day and a half to work it out? Be serious. We felt we had a bargain that was fair to both companies. The disappointing part was the lateness and the shotgun ap-

Although officials of Robertson Colman refused comment, the revised opinion apparently resulted from the gloomy short-term financial outlook that Convergent recently presented to security analysts. Two weeks ago, Convergent projected first-quarter revenue of between \$70 to \$80 million and earnings of between zero and 5 cents a share, compared with earlier projections of \$90 million in revenue and carnings of between 5 to

At the same time, 3Com's aiready rong business outlook became ever brighter, and the investment bankers essentially advised that one Convergent share was no longer equal in val-ue to one 3Com share. For the third quarter ended Feb. 28, 3Com recorded \$16.9 million in sales and \$1.8 millon in profits, with the revenue rep-resenting a 107% increase over

year-ago totals.
"There was a strengthening 3Com's order situation of late and the third-quarter figures caused Robert-son Colman to reevaluate the situa-Krause said. He cited a resurgent interest in Ethernet, increased demand for multiuser applications and 3Com's shipment of the 3+ net-

work operating system as factors bol-stering recent sales. Indications of problems with the merger began to surface last week when attorneys instructed 3Com and Convergent executives to press interviews slated to take place before the shareholders' meeting. Convergent founder and former Chairman Allen Michels was sur-prised when Computerscorld told him of the failed merger. "I regret the

decision taken by the 3Com board, Michels, who left Convergent

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